JUNE 1960

DATA PROCESSING

THE MAGAZINE OF AUTOMATIC OFFICE METHODS AND MANAGEMENT

DATA PROCESSING SPECIALIST -BUSINESS PARADOX

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Data Processing Education at the University Level —page 9

Programming for Personal Profit —page 15

Semantics in Data Processing Supervision —page 19

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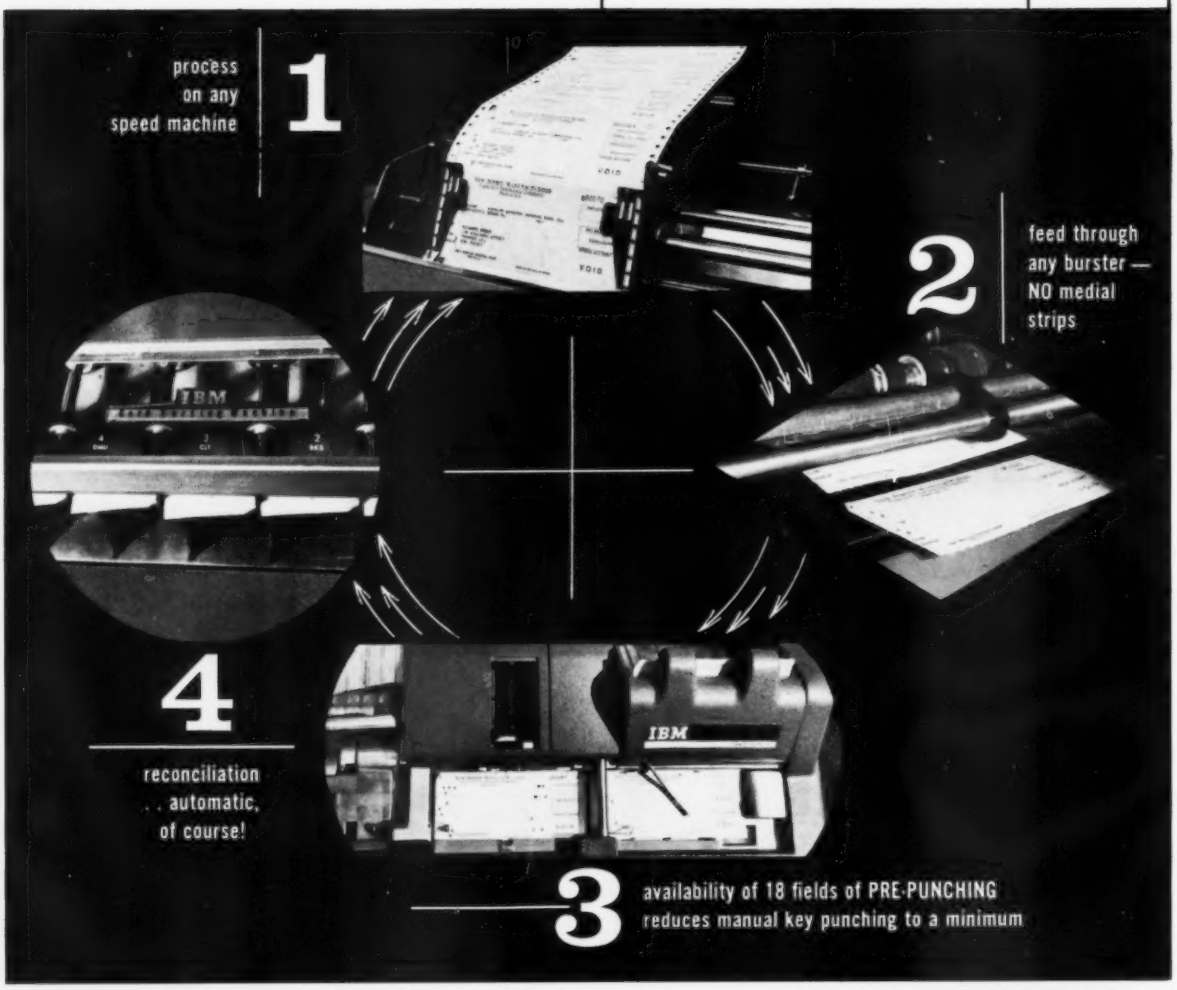

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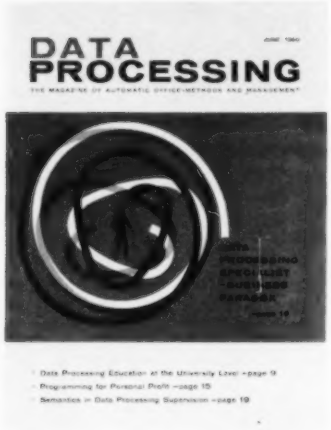

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Also publishers of The Punched Card DATA PROCESSING Annual (Applications Volumes and Reference Guide) and Data Processing Handbooks.

OBSERVATIONS . . .

from the publisher . . .

YEARS AGO I studied fine arts under a well respected artist and teacher. The students and I were critical of this instructor's teaching methods in that he seemed to restrict his attention to a certain few in the class. I did not appreciate being left on my own to struggle with the fundamentals of drawing technique, the mixing of pigment and its proper application to the canvas. After months of frustration I found myself in with the select few. While I was pleased I was also curious to know the reason for the change in his attitude toward me. His answer was, "You have become interested in your work, therefore I have become interested in you."

You may justifiably ask, *"What has this to do with data processing or even the publication field?"* Although I didn't become an accomplished artist, I learned a principle from this teacher that is significant.

Trying to be all things to all people is a dangerous and shortsighted publishing approach. It can cause a publisher to forsake the high principles of his calling and start playing the numbers game.

Data Processing is a specialized magazine intended for those people who are really interested in this field. They may actually work with equipment, or their interest may be from a management viewpoint. The important limiting factor is their avowed *interest*.

We have never sought a large circulation for that sake alone, or as means of attracting advertisers. This magazine was established on a paid circulation basis because it is our desire to serve those who have a definite interest in data processing. As a subscriber to *Data Processing* you have attested to your above average interest in activities in this field. We therefore are interested in you — it is our business to serve you. And alert advertisers respect this selective policy.

It gives us a great deal of satisfaction to know that every copy of *Data Processing* reaches a person who is vitally interested. We could not have this same satisfaction if we thought that thousands of copies reached disinterested persons or found their way into the *"circular file"* without being read.

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AUTHORS

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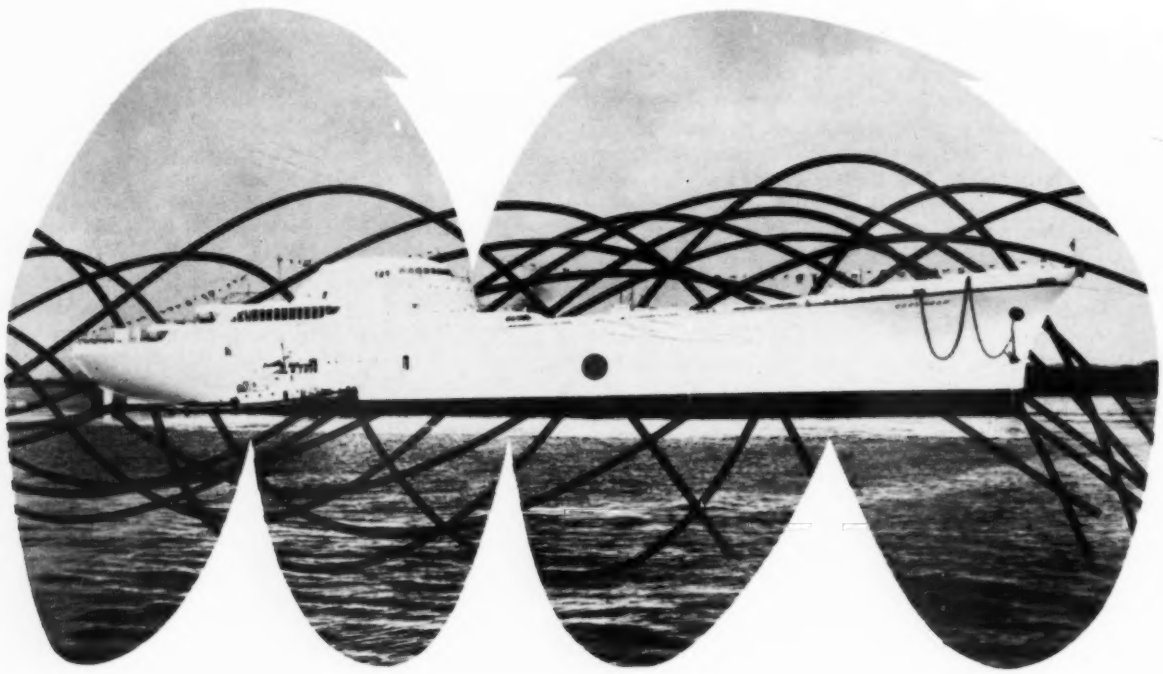
S. W. BROSSMAN *("Semantics in Data Processing Supervision")* is Professor of English and Chairman of the English Department and Language Arts Division at Chaffey College, Alta Loma, California. He received a B. A. from UCLA and a M. A. and Ph. D. from USC in the field of communication and literature. Dr. Brossman has also been employed as a communications and management consultant by industry. He served in World War II operating the first height-finding Army radar unit, which he helped design, and also served in the Korean conflict. He is the author of numerous articles which have appeared in publications such as *Advanced Management, Research/Development,* and *Business Education World.*

DOUGLAS D. HUBBARD (*"Data Processing Specialist —Business Paradox"*) is an Administrative Staff member and Data Processing Supervisor for The Cowlitz County Public Utility District No. 1 of Longview, Washington. He attended Pacific Lutheran University in Parkland, Washington and has served in the data processing field for thirteen years. Mr. Hubbard was associated with The Long-Bell Lumber Company in Longview, Washington from 1947 to 1951 in Research and Machine Accounting. In 1951 he directed the conversion from manual methods to punched card procedures at The Cowlitz County Public Utility and has been with the District since, except for a period in 1956 when on leave of absence, he supervised the conversion to punched card accounting for The Oregon Mutual Savings Bank in Portland, Oregon. He is a member of The Portland Chapter of The National Machine Accountants Association and has had articles on data processing published in professional and business journals. In 1959 one of his articles, *"What Makes the Installation Run?"* which was published in the *New York Times,* won first place award and $500.00 in the Data Processing Category of The Office Management Center competition sponsored by The Office Executives Association.

GEORGE M. PERRY *("Programming For Personal Profit")* is Planning Assistant in charge of the Technical Planning Section of The Travelers Insurance Company's Data Processing Department. Mr. Perry joined The Travelers initial EDP group after graduating from Tufts University in 1954. He has been involved in the evaluation and feasibility studies of computing equipment and in the subsequent standardization of programming and operational techniques for the IBM 650, RCA Bizmac and 501 computers, has collaborated in the production of an automatic coding system for the Bizmac, and is a member of the CODAYSL effort that is producing a common business oriented language (COBOL). ■

For the Babcock & Wilcox Company:

a Burroughs 205 computer backed the team that introduced atomic power to the merchant fleet...



another Burroughs computer is helping build one of the world's largest steam boilers...

and still another is speeding a vast research and development program

History has already earmarked July 21, 1959, in remembrance of launching the N. S. Savannah—the world's first nuclear merchant ship. This graceful queen of the seas may well be the precursor of a vast atomic merchant fleet—ships operating quietly and efficiently on nuclear engines.

Yet months before touching water, the Savannah's nuclear propulsion system was obtaining hundreds of "trial runs" on a Burroughs 205 computer at The Babcock & Wilcox Company's Atomic Energy Division in Lynchburg, Virginia.

Long before the vessel was launched these computer runs predicted changes that were to take place in the heart of the nuclear reactor. With the aid of these data, decisions were made as to the optimum size of the reactor, the lifetime of the fuel elements, amount of fuel needed, approximate costs and myriad other specifications.

Of course, a simulated run could have been made with a desk calculator—but it would have taken one year to complete a single run. The 205 has completed the same job in just a few hours.

This is the latest installment in a success story that started in November, 1955—the installation date of the Burroughs 205 at the Atomic Energy Division. Aside from the N. S. Savannah project, the same computer contributed immeasurably to other reactor designs, and other engineering work involving stress and thermal calculations, plus cost accounting data processing.

A recognized pioneer in the application of electronic data processing equipment, B&W was one of the first companies to develop its own automatic programming system. The effect of this powerful programming aid—called DUMBO—is to extend the capabilities of the 205 to hundreds of engineers without special knowledge of computer characteristics and techniques.

B&W engineers at Lynchburg are now able to write a plan for the computer to follow; DUMBO then automatically translates the plan into 205 language for electronic data processing.

With valuable 205 experience on design problems of a different nature, B&W's Boiler division (at Barberton, Ohio) has now installed a larger Burroughs 220 computer system to handle its increasing activities. Now in the design stage, with the aid of the 220, is one of the largest steam boilers ever conceived. When finally erected, the new steam boiler will stand as high as a 22-story skyscraper, produce 4,900,000 pounds of steam per hour, and generate sufficient power to light a city of 5,000,000 population.

Whether designing mammoth power equipment or a small industrial boiler, the Burroughs 220 has become a vital tool from initial bid through final design. The Burroughs 220 is helping to win orders with fast-but-realistic proposals, slashing costs and lead time at every possible opportunity.

B&W, whose product range includes tubular products, refractories, and marine boilers, as well as stationary steam generators, is also spearheading the development and construction of nuclear stationary and marine propulsion power plants. In all these programs, B&W depends upon the most modern analytical processing equipment.

At the company's Research and Development Center based in Alliance, Ohio, a third Burroughs computer has recently gone "on the air." This Burroughs 205 was purchased to process data for a variety of research experiments in the fields of heat transfer, fluid flow, stress analysis, and thermodynamics. Its immediate impact has been to free creative engineering talent from routine calculations and to reapply valuable human resources to the pursuit of new sources of economical energy. This 205 has already developed research data otherwise inaccessible.

All three Burroughs computers are helping B&W to meet a wide range of the nation's power requirements in the most efficient and economical way possible. Hundreds of other industrial and commercial users are confirming similar experiences.

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Comments from Readers

"A New System"

Boston, Massachusetts

Dear Sir:

The article [Mr. De Paris' *"A New System"*] in the March issue of DATA PROCESSING concerning the applications and specifications for the IBM 1401 computer is most interesting. It is one of the clearest explanations of computer operation in language a layman can understand that we have seen.

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Rock Island, Illinois

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Permission is requested to reproduce the following material for use as a course handout, to wit: *"An Evaluation of Equipment for Expansion of Data Processing Facilities,"* published in the March 1960 issue.

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Ordnance Weapons Command

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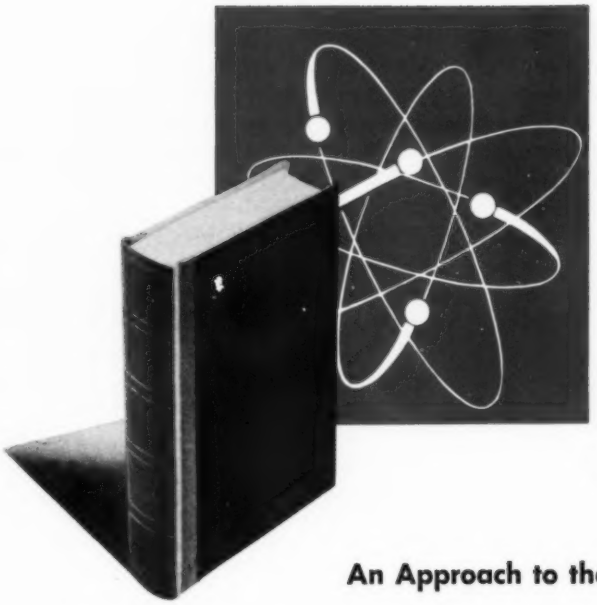

Data Processing Education at the University Level

An Approach to the Curriculum and Teaching

SINCE EARLY 1940, the term *"data processing"* has become synonymous with automatic recordkeeping systems. However, the interpretation of benefits from data processing are varied: (1) To the $50-a-week office worker it would probably mean simply longer coffee breaks; (2) To the cost accountant and top management it means faster and more efficient cost and profit control reports this week instead of next month or even next year; and (3) foremost to the educator, the teacher of business subjects such as accounting, marketing, statistics, production and economics, it means a new idea for solving the same old problem with economy of speed and a greater degree of diversity. As an empirical definition, contemporary Data Processing means: The diagnostic treatment of information either alphabetical or numerical by a predetermined standard of routines through the use of electro-mechanical, electronic or magnetic data processing apparatus.

For the past few years, managerial and/or executive positions in the data processing field have been filled predominantly with competent graduates in areas such as the sciences and engineering. Industrial employers tend to agree that business graduates with backgrounds in data processing are much more desirable. Further comment from the same source would reveal that this situation exists primarily because of the insufficient supply of business graduates with a concentration in data processing.

In an attempt to offer the schools of business a definite program for increasing the number of qualified graduates in data processing, the following topical areas need an analysis:

(1) The curriculum and course offerings
(2) Teaching approaches.

The Curriculum

"Our curriculums are top-heavy," is a very familiar cry of college deans of the past decade, which has become saddened with the evolution of courses in data processing. However, the problem of extensive course offerings in this area is compounded with great complexity. This fact is true primarily because offering one course entitled *"An introduction to electronic data processing,"* is insufficient to equip our graduates in business to meet the challenges of our dynamic economy.

The problem has particular significance to those schools offering only the bachelor's degree in busi-

By Vincent H. Jones

ness and commerce. This problem is depressing because of inadequate and improperly trained staff personnel at this level. The constant industrial demands for graduates with experience and facility in this area have exerted commanding pressures.

These factors suggest to the so-called bachelor business school one of two alternatives — either offer or do not offer data processing. Generally the schools of business offering graduate degrees do not have a particular problem in this respect, because qualified personnel are readily obtainable at their going salary rates. This fact was supported by Gordon and Howell in *"Higher Education for Business"*.[1]

Experience of educators, industry, and manufacturers of data processing systems suggests the following might be a compatible core-curricular course offering in data processing:

Descriptive Courses	Probable Credits
Introduction to Data Processing	3
Programming Business Computers (Basic)	3
Programming Business Computers (Advanced)	3
Systems Design Planning	3
Topics, Research in Data Processing	3

Additional supplementary course offerings of graduate schools might include operations research and numerical analysis, or advanced topics in calculus. Generally, this suggested course offering would tend to satisfy the schools of business and is not in any aspect intended as an outline for engineering or the sciences.

The Teaching Approach

Unfamiliar terminology and the inherent technology of data processing apparatus cause the usual teaching techniques employed in other business subjects to be practically non-applicable. The teacher is forced to translate data processing language into meaningful, everyday, common usages of the student whom he instructs. This is by far the most difficult task to accomplish in the teaching of Data Processing. In an effort to mend the problem a glossary of terms is usually very helpful.

With reference to teaching approaches, two determining factors must be considered: (1) Basic orientation and objectives of the school, and (2) the local or regional demands of industry. Generally schools located in the Midwest and East tend to orientate themselves toward the academic approach and prepare their graduates to man managerial and/or executive positions. Employment opportunities in these same sections tend to exist for similar positions. This analysis presupposes that the systems analyst and supervisor are needed in the larger urban communities and the technicians are needed in the smaller urban communities.

Based on a survey of 48 of the nation's leading professors in the data processing field, facts revealed two alternative approaches to the teaching of subject matter: (1) The theorist approach which emphasizes managerial control and systems design exclusively, and (2) The technician's approach which encourages the teaching of basic operational principles and programming data processing apparatus as a major emphasis. Further facts would indicate that the professors who represented the larger middle Western and Eastern schools are followers of the theorist approach, while on the other hand, the westerners and southerners are advocates of the technician's approach. Inevitably, the approach employed would to a great extent be determined by objectives of the school and the particular region.

The comparative table below illustrates the various topics taught by the two approaches, and the relative emphasis is placed on each topic.[2] *(This analysis is for an introductory course offered on a semester basis):*

	Number of Weeks devoted by:	
Topical Areas	Theorist's Approach	Technician's Approach
History and Introduction	1	1
Functional Wiring Principles	0	8
Systems Design and Management Reports	6	3
Basic Applications and Case Problems	5	3
Programming and Computer Principles	4	1
Invited Lecturers and Field Trips	1	1
Periodic Examinations	1	1
Total weeks devoted	18	18

It is evident that there exist minor variations of this table in some schools. The comparative study is intended to represent conditions generally. In some cases certain insignificant topics have been omitted.

The basic problem of an insufficient supply of business graduates with limited experience and facility in areas of data processing is increasing. This situation will obviously continue to exist unless our schools of business adopt a definite program for improvement in the areas of sound curricular development, sufficient course offerings, and effective approaches to the teaching of data processing.

It is men who man machines and not machines that man men. ■

[1] "Higher Education for Business", Gordon & Howell, New York, 1959, pp. 349-53.

[2] This survey was conducted at the workshop-seminar *"Data Processing for Professors of Business Administration in University Schools of Business"*, International Business Machines Corporation, Endicott, New York, August 17-31, 1959.

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NEWS SUMMARY

GENERAL

Aid to Census Taking

A joint team of the United Nations Organization and the Food and Agricultural Organization have been surveying the problem of getting results from masses of *statistical data*, a problem exceptionally acute in underdeveloped countries. The first results have been distributed to member countries of UNO and FAO to use in the 1960 World Census.

Republic Flow Meter Co. and The Thompson-Ramo-Wooldridge Company have agreed to cooperate in designing and furnishing *computer operated* systems for the electric power industry.

Radio Corporation of America demonstrated its tunnel diodes for computer *information handling*. These diodes manipulate data at the rate of over a billion bits per second. Also shown was a ferrite memory device of 2,048 bits of information condensed into one cubic inch.

Thompson-Ramo-Wooldridge and the U. S. Weather Bureau tested a new weather detecting system for the Bureau's project AMOS — Automatic Meteorological Observing Station, whose goal is to provide a greater number of weather stations throughout the country with unattended, automatic weather instruments.

NEW APPLICATIONS

Brooklyn Union Gas Company has ordered an IBM 7070 to process data for over a million gas meters. Primary application will be for *billing and statistical data*. Four IBM 1401 systems will be used with the 7070. *Inventory and payroll* will also be processed.

An IBM 704 is speeding the *flow of technical information* to scientists in the U. S. and abroad with the publication semi-monthly of a 104-page publication, Chemical Titles. This is a bibliography of over 3,000 published articles in the chemical field which contains a significant key-word as the nucleus of the contents of each article. The process is adaptable to any of the general purpose computers.

Property Identification

Dashew Business Machines and the NATO Maintenance Supply Services Agency have agreed on the installation of a *property identification system* which will tie in directly with the electronic data processing system being installed. The Dashew system utilizes a metal plate attached to each item before it is shipped and with keyed holes punched into the plate, the tag records the property stock number onto punched cards which are used in inventory records, requisitions, etc. Electronic Databossers will convert NATO's punched cards into the embossed self writing metal tags.

Computer Sharing

Stanford University and the First National Bank of San Jose will share a Burroughs 220 computer system. The university will use it during the day and the bank will use it during the night for eight hours to process 2½ million transactions to customer accounts and to prepare statements.

Eastman Kodak's *communications network* is helping the company coordinate its operations more closely. The network has a 4900 mile telephone system and a 6700 mile teletype system. Data from more than 30,000 punched cards is transmitted daily for central processing in the Rochester data processing center.

Marketing Analysis

A Burroughs 205 computing system will be utilized by the National Aeronautical Laboratory of Japan for *processing wind tunnel* data on flight behaviour of model aircraft. Two other 205's are performing *marketing analysis* for grocery stores. Certified Grocers of California, Ltd., a retail owned wholesaler, uses the dual 205's for billing, inventory control and Member Purchase Analysis reports.

MILITARY

The Tiros I satellite was directed into its orbit by the Bell Telephone Laboratories Command Guidance System.

Stars are still the test of navigational accuracy as Bendix uses them to test the reliability of the Minitrack network. This network is used to record the orbit of satellites launched into space. The data from these stations are computed and a satellite's actual orbit is then determined, as well as its deviation from its preplanned path or orbit.

COVER FEATURE

DATA PROCESSING SPECIALIST — BUSINESS PARADOX

A glimpse at the traits of the "ideal" data processing manager

A GREAT DEAL OF EFFORT has been devoted in recent years toward bringing to the attention of the American public the herculean tasks being performed by machines in the field of data processing but what of those people behind the scene — the data processing managers themselves? What manner of person is he who circulates in this astounding world of automation?

First of all, he is already a success in a most demanding field, or he wouldn't be in it at all. He possesses a paradoxical collection of characteristics, the nucleus of which is made up of a slight twinge of laziness that drives him to dream up some of the *dog-gonedest* ideas to avoid work by figuring out ways for machines to do it *for* him. At the same time, he must be ambitious enough to work himself to a frazzle accomplishing this.

He must scurry around fast enough that all activities under his direction are completed on time, but he must not be in such a hurry that he forgets the significance of the operations he is performing.

He must have the ability to diplomatically oppose his superiors in such a manner that he can convince them they are wrong without ruffling their feathers or causing them embarrassment.

He must remember always that the business is not being run exclusively according to his direction, and therefore he must go along with some things in which he does not personally believe. However, he must not let the recognition of this fact blind him to his obligation of taking a firm stand on matters of which he has a more thorough knowledge than those to whom he is responsible.

A Curious Mind

A data processing manager must have a gnawing curiosity about everything that goes on around him. His reaction to all activities and developments must be a big, spontaneous, *"why?"* He must wonder why every report is run, and why less people or more people don't receive them. He must wonder why a certain machine gets so much usage or so little usage. He must wonder why a manual job laboriously performed in another department is not

(continued on next page)

By Douglas D. Hubbard

on the machines, and why a very small job with a multitude of machine steps *is* on the machines. He must have an insatiable curiosity, so consuming that it keeps him actively engaged in learning, probing, improving, but his established duties and commitments must not be neglected in his quest for additional facts.

A data processing manager must respect his superiors and their knowledge but not believe their assertions until he proves to himself by machine that their statements with regard to his work are accurate. No matter who says totals will never be negative on some report or form, the true specialist will wire for conversion and credit indication just the same. Even if it's the president of the organization who says a file of cards is in ascending order after manual posting or filing, he will sequence them anyway before running them secondary in a match or merge.

Eternal dissatisfaction is a prerequisite for any who would be a part of this data processing business, because complacency and content have no place in a field where everything must always work better and go faster. And so the man who is irritated by wasted machine cycles, non-essential reports, and unrealistic scheduling is much more valuable than the fellow who thinks things are just swell. On the other hand, the ability to recognize a shortcoming is useless without constructive ideas for remedying it, so the man who is dissatisfied with the way things are going is not to be confused with the man who is *complaining* about the way things are going.

AUTOMATION ARTOON

Bowl, 11th - 12th century. Collection M. Larcade
[Photo, courtesy American Institute for Iranian Art and Archaeology]

"THIS NEXT SLIDE IS A FLOW CHART ILLUSTRATING FEED BACK. AS YOU CAN PLAINLY SEE THE INTER-SPACED GANG PUNCHING IS TIED DIRECTLY TO THE . . ."

Keeping Proper Perspective

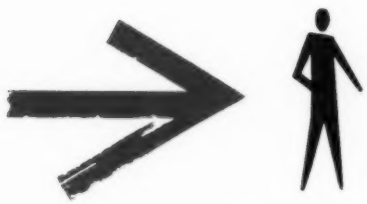
A true data processing specialist is a fellow, who, though he lives in and for his world of electronic apparatus and cards and magnetic tape and such, never loses sight of the fact that his *organization* is responsible for *his* being there — *he* is not responsible for his *organization's* being there. So he bows to its requirements and does not expect it to bow to his.

He has the peculiar ability to communicate with creatures of his own kind in technical terminology but he also has the discretion and respect for those outside the circle of his field to refrain from springing terms like *"digit pickups," "hot ten impulses," "interlock suppression,"* on them. He knows they will listen longer and understand better if he translates his technical knowledge into terms that do not put them at a disadvantage.

He doesn't exactly have to be the *"Typical American Boy"* type fellow, but he *does* have to be a nice enough guy that close association with his co-workers is possible without friction or discord. This business calls for a whale of a lot of activity under pressure, and oftimes this pressure wears jangled nerves pretty raw. The fellow who is prone to go around blowing his stack, or causing others to blow theirs, just doesn't last.

A great deal of training and experience go into the process of attaining appreciable stature as a man of data processing. There are many things he must be, and many things he can't allow himself to be. He must not overstep himself, and yet always assert himself. He must be seriously concerned about his department's shortcomings but not defeated by them. He must be capable of disagreeing without being disagreeable. He must always be receptive to new ideas and developments, but not be carried away by them. He must be energetic enough to eat, breathe, and sleep his work, and relaxed enough to feel that everybody in the world works harder than he does.

In the end, though, what really makes a data processing man is the dedication he feels toward his place in this demanding world of flow charts and procedures and frantic deadlines. When his machines become his friends and he can coax their optimum performance from them, when the way he moves and the things he does reflects his confidence that there really *is* order to all the pandemonium, when his expression and manner reveal quite clearly that this is where his heart is — then he's a Man of Data Processing! ■



PROGRAMMING for PERSONAL PROFIT

What type of programmer is professionally admired?

THE GROWTH OF ELECTRONIC DATA PROCESSING as a recognizable management science has been attended by the development of the data processing specialist, whose proficiency and progress in this new and somewhat awkward profession is generally defined by categorizing him as a programmer, analyst, etc.

As in any new profession, the criteria of proficiency is not specific, and to fill this void, programmers have naturally developed means to relate their ability with that of their contemporaries. To gain respect within the clan and to attain the peak of success *(i.e. being recognized as a professional programmer by one's confederates)* the programmer must become adept at *"sophisticated"* programming.

This sophistication is often measured by the programmer's ability to perform functions in fewer program steps than anyone else. A *"sophisticated"* program fairly reeks with B-box modifications, *"suicidal"* loops and bootstraps, self-modifying instructions and, above all, switches. The supposed mark of the esoteric program is the ability to use one series of steps to perform many seemingly unrelated functions. The *"switching gear"* in some programs is so complex that everyone associated with it *(including the computer, and oftentimes the programmer himself)* is soon hopelessly confused.

Typical Programming Problem

To illustrate the effect of sophistication, let us examine a typical programming problem and various approaches that could be followed. The problem is an edit involving six different types of transactions. Programmer "A" attacks each type separately and meticulously creates the edit routine. He produces about 200 steps for each, and, as he writes each routine, notices marked similarities in requirements. However, he plugs stolidly ahead, and ends up with a straightforward program of 1200 steps. His debugging is quite easy — after one routine is debugged, the rest follow rather quickly.

Programmer "B" is also given this problem and immediately senses the opportunity to be sophisticated. He notices the similarity in the transaction types and proceeds accordingly. He constructs a main processing routine, of about 200 instructions, that fits the general requirements and then builds a modifying routine of 20 instructions for each transaction type. His program is full of gimmicks and has a total of only 320 program steps. Although it takes him quite a bit longer to debug his program, his ingenuity is admired by his compatriots *(except perhaps programmer* "A").

Programmer "C," being somewhat mellowed and weatherbeaten by the effects of many a programming crisis, is unimpressed by Programmer "B's" gyrations. He immediately detects that processing time would be about 20% greater for "B's" program. He knows, from his own sad experience, that the program will become "B's" personal albatross. Nobody else could possibly follow the complex logic and make the changes that will be necessary from time to time. The programmer that enjoys making changes to a job he wrote years ago is a rare animal indeed.

Programmer "C" attacks the program much as did "A," after rejecting the common routine approach. He programs the edit of one type of transaction and comes up with approximately the same steps that "A" did. He then, however, sits back and takes a long hard look at the logic of his solution. He notes where he has produced redundant and su-

By G. M. Perry

perfluous coding. He rearranges his thinking many times, programming sections in two or three different ways before finding the optimum approach. He finds that the optimum solution requires only 180 steps and is 20% faster than "A's" approach. After he has found the best approach for one transaction code, the rest fall in line and the programming is fairly simple. His total program requires nearly as many steps as "A's," and three times as many as "B's." Yet his processing time is 20% less than "A's" and 40% less than "B's."

Different Approaches

"A's" approach to the problem was certainly not sophisticated. It was efficient in that it got the work done in a reasonable time, in a manner that anyone could follow, and with adequate processing speed.

"B" thought his problem was the essence of sophistication. It would be better termed *"dehydration."* All he did was to squeeze the steps into the smallest possible space. His sophistication was in programming technique, which unfortunately, does not guarantee efficiency.

Programmer "C" also applied sophisticated thinking to his program. But, he applied his thinking on the logical approach rather than the programming technique. He was able, of course, to get the most out of the machine logic, but not in a manner that would confuse the solution to the problem.

Dehydration is a technique that cannot be completely condemned. It may be necessary if the programming requirements for a given job are seen to be more than 80% of the usable computer memory. The only alternative to dehydration is the use of overlays, which should be avoided if possible. If, however, it is seen that even a completely dehydrated program will exceed 80% of capacity, there is good reason to reanalyze the problem and consider the possibility of separating it into two programs. It is better to break a problem into two runs during problem definition than to wait until the first major change in job requirements necessitates complete reprogramming.

Our three erudite technicians differ in other respects in addition to programming technique. Programmer "A" follows the programming procedures that he is told to, not without a little grumbling, perhaps, but he produces detail flow charts and prepares a reasonably adequate program package without really questioning why.

Programmer "B," however, cannot be bothered with detail charting. He relies on charts that he calls *"gross logic."* This means that his desk drawer contains a gross of scraps of paper, old envelopes, etc., decorated with unintelligible hieroglyphics which resemble a first grader's attempts at art. He boasts that he will never be expendable — who else could follow his programs? He is right — nobody else can. As a matter of fact, he spends most of his time applying chewing gum and baling wire to keep his programs operational. Any change in requirements produces chaos — no flow charts, no remarks on his coding sheets — he has not the slightest idea what happens where in the program. His approach to making a change might well be called the *"pin the tail on the donkey"* technique. His donkeys have so many tails that they are beginning to resemble octopi.

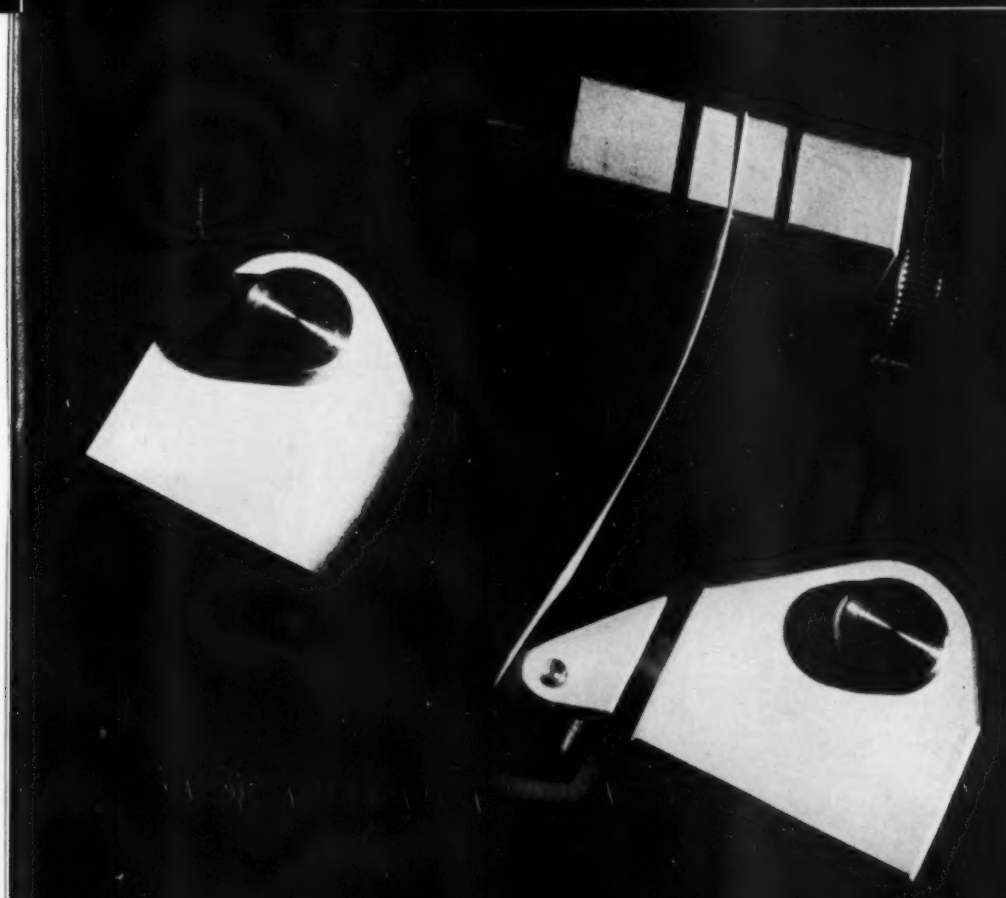
Programmer "C" dislikes the clerical work attendant to writing a program as much as anyone. But he meticulously prepares detail flow charts, his program listing remarks are the essence of legibility, even his *"pseudo"* program is kept up to date to allow reassembly. With him, it is a simple matter of self preservation. His operating manual is so complete that rarely, if ever, will he be called by the computer operator to interpret an operating condition that is not contained in the manual. The effort he expends in completely documenting his program is compensated for by the realization that changes to the program in the distant future can be handled by inexperienced personnel; he need not be deterred from his usual frenetic state to change something he has long since forgotten about.

Importance of Standards

From this discussion, it is apparent that Programmer "A" is somewhat less experienced than the others. Being a chap of above average intelligence and ambition, he seeks means of bettering himself. A recent psychological study claims that the average programmer wears a facade of imperturbability beneath which lies a seething mass of conflicts, aggressions and ambitions. Whom will he emulate — "B" or "C"? Probably "B," who undoubtedly has greater prestige among his fellow workers.

If "A" were to take a cold hard look at the situation, he would soon realize that the ability to fill a program with gimmicks does not materially affect the size of his pay check. He would be better served to find what management wants. Management is not concerned with the number of steps in a routine nearly as much as it is with the efficiency of the processing, the time spent in programming and debugging and the results from a program once it is in production.

With these aims in mind, the programmer can appreciate the need for charting and coding standards, efficient debugging procedures, and rules for program maintenance. Once he understands that standards are in the programmer's best interest, and not the whims of an unconcerned management, he can best attain the ambitions that are churning within him. ■



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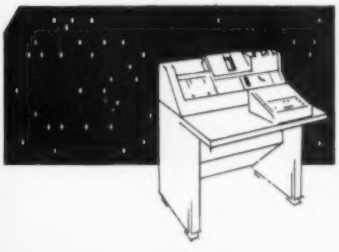

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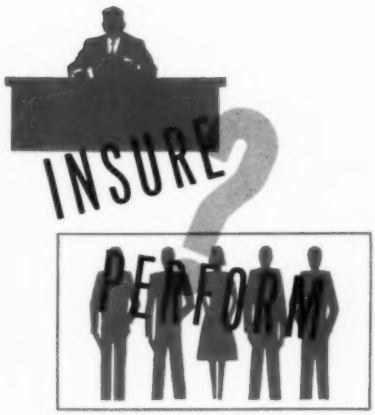


SEMANTICS in Data Processing Supervision

Do you know what you mean and mean what you say?—Views in the communications game.

By Dr. S. W. Brossman

THE ACTIVITIES of *"perform"* and *"insure"* can best be distinguished by thinking of little boxes on an organization chart rather than thinking of real people. That is, the difference between the two words involves group functions rather than human actions. None of this is true, of course, because only people can do things. And yet this is the way the communication game works. And we all play it — every day.

For example, we say that *"X Company manufactures products"* and that the *"Data Processing Department processes reports."* Actually, though, unless you equate *"X Company"* and *Data Processing Department"* with *"people,"* both statements are meaningless. If you say that everyone in the Data Processing Department, no matter what his role, contributes somewhat to the processing of reports, then everyone has an overall department performance, namely, the production of reports. Even high-level supervisors, then, are performers of a sort.

When we say that a group *"performs"* general data processing functions, we mean everyone in the group does so, including the group supervisor. In other words, even though the men at the machines actually do the processing, the supervisor *"insures"* that the work is done properly.

Question Is Relative

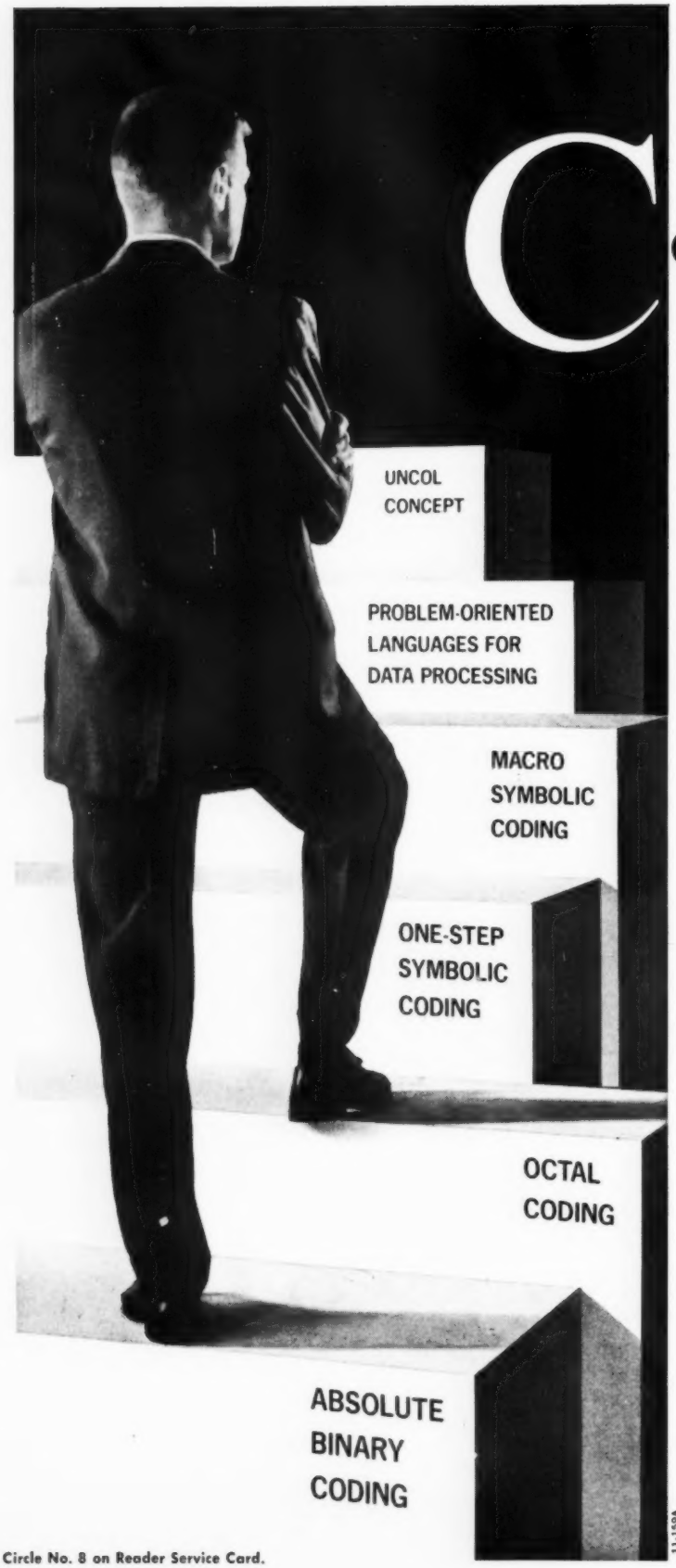
Every group with an industry is a theatre, and every supervisor is a performer on his own stage. And some supervisors are greater hams than others. But this is beside the point. The point is that within a data processing group, for example, the supervisor *"insures"* that data processing activities are performed adequately, but outside his group the supervisor, as the chief character of the data processing group, *"performs"* data processing functions, for it is now general administration that insures that the Data Processing Department is provided with adequate general processing services. Therefore, the definitions of *"perform"* and *"insure"* are relative. Which is all right. We just have to make sure that we always take the same relative point of view.

Going a step higher, the question may now be legitimately asked, what does the general administrator do? Does he perform or does he insure? Again, the question is relative. Everyone within his own group performs activities. Even the act of making sure that the data processing supervisor operates an efficient group is a performance by the general administrator, because that's one of the general administrator's functions. But to the top boss, the general administrator doesn't perform before the footlights, even though occasionally he does have the spot turned on him. Rather, he exerts an influence backstage, whispering cues to faltering supervisors, auditioning up-and-coming young characters, and occasionally ringing down the curtain on bad actors.

Theories

Looking at the drama from a front-row orchestra seat, in the theatre but not quite within the play, I would advance the following theories about industry's use of *"perform"* and *"insure"*:

1. The lower you are the more you perform.
2. The higher you are the more you insure.
3. No matter how high or low you are, you always perform within your box, even while you're insuring.
4. But the real test as to whether you are performing or insuring is whatever your boss thinks.



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RAY MARIEN

–A Monthly Feature **Marien on FORMS**

How to Make a Paper Mountain

The celebrated cartoonist, Rube Goldberg, is famous for his comic *"inventions."* In fact, the expression *"a Rube Goldberg contraption"* has come to mean any fantastically over-elaborate device for performing a very simple task. For example, Mr. Goldberg's mousetrap *(one of many he drew)* consists of a series of traps, hammers, strings, wires, chutes, treadmills and what-not and fills an entire room. Ultimately, the mouse does reach that *"big corral up yonder,"* but by that time he's so tuckered out from all the gymnastics he's been through that he greets it with a sigh of relief!

Rube Goldberg draws his *"inventions"* to amuse people. They are not meant as serious attempts to solve minor problems. Yet, every organization probably has at least one or two individuals on its payroll who think along the same lines, yet who are *not* trying to be funny! In all probability, they do not realize the extent to which they carry out these fantastic procedures. Many of them start off innocently enough but soon are so replete with gimmicks and devices that Rube himself might be proud to claim them as his type of *"inventions."*

One area where much of this goes on is in the field of data processing. To some people mechanical equipment can be used for any purpose, whether it be a giant brain or a tabulating machine; a card punch or a tape-producing typewriter. They see it as a *machine,* an object that can *replace* man, perhaps even make man *obsolete!* So they regard its potential use as limitless.

One example we heard of recently is the use of accounting machines to produce standard procedures. A separate card is punched for each line in the procedure and *"away we go."* The reasoning is that changes then become very easy to make. Entire paragraphs or merely a line or two can be changed simply by preparing new cards, and running the whole job through again. How long do you think it takes to type up a multilith master, or paste-up the old copy and make a Xerox master from it? Which do *you* think is the simpler way to do it? But then, this is the space age and we don't want to use bicycles any longer — or do we?

What *Not* to Automate

Undoubtedly, one of the silliest uses to which data processing equipment can be put is the preparation and maintenance of a functional file for forms control. Yet, a surprising number of companies not only do this, but boast about it openly as if it were an achievement equal to the first man rocketing to the moon. Frankly, if I headed up a company that engaged in such a travesty on data processing, I believe I'd take pains to assure that both my data processing supervisor and forms analyst got a trip on that first rocket heading into outer space—a one-way trip, that is!

Imagine all the preparation, card-punching, sorting and tabulating runs necessary to maintain such a *"file"!* Notice the quotation marks around the word *"file."* Actually, it is only a listing, or a record of a file. The forms themselves still have to be filed somewhere, and they have to be *seen* to be analyzed. A proper forms control *functional* file is a working tool, not a mere pile of tabulated data one-half inch thick!

Purpose of Functional File

The purpose of a functional file is to gather together all forms doing similar jobs. A simple file cabinet, with functional coding will do that and it will enable the forms analyst to instantly see *all* the forms in a specific category. What can he visualize from a printed list of form numbers and descriptions? Will the titles tell him what the forms look like? Every time he wishes to check a certain category of form does it necessitate a tab run to furnish him with the names and numbers of the forms? If it doesn't, then he's using *dated* information. Even if such a listing is made semi-annually it can still be up to six months old! What good is that? Especially when someone has to go to a numerical file and pull out every single one of the forms *anyway* to see what they look like!

Other adherents of data processing use for forms control boast of its value in consolidating printing purchases. Here, again, it verges on the ridiculous. Certain forms lend themselves naturally to group purchasing. There is not enough space here to go into that problem because an entire book can be written on the subject. Suffice to say that such forms as purchase orders, envelopes, letterheads, tags, invoices, checks and the like are obvious choices for consolidated buying. No one needs to send their data processing operation into overtime to furnish that kind of information. They are grouped together readily enough without making an *"operation moon-shot"* out of it. Besides, they might never get it off the launching pad!

Yes, the age of mechanization and the space age are upon us and we have to face up to it. Meanwhile, if you'll excuse me, I have to get back to work. I'm trying to *"program"* the *"coffee break"* and I don't know whether to try tape-to-card, or card-to-tape, or card-to-card . . . ■

Dreyfack on PERSONNEL —A Monthly Feature

Delegate Your Troubles Away!

RAYMOND DREYFACK

Who has the upper hand in your department — you or the clock?

It's easy to tell. How many times a day do you look at your watch with a worried frown? How often are you *"behind"* in your work?

If you come to the honest, albeit reluctant, decision that old Pappy Time has you by the seat of the pants, then the hour has come to face up to the realization that you are probably a victim of that ancient Roman disease: Anemo Delegadi — insufficient delegation. With this decision made, half the battle is won. It is now time to act.

At the outset let's clear the air of any confusion and doubt regarding your status with the company. Do you want to be known as Indispensable Man No. One, or do you want to get things done and get ahead? If indispensability is your objective read no further. Not much we can do for you here. You won't want anyone to know your work. Your chief concern is to enshroud yourself in an atmosphere of technical mystery and voodoo.

But, if you're of the more enlightened generation — and most people with the initiative and open-mindedness to go to the trade mags for counsel and assistance are—then you've reached the conclusion that something definitely must be done about this back-breaking mountain of work you find yourself buckling under. Somehow or other you'll have to beat this clock problem, and continue to blaze an upward trail for yourself.

Define Your Problem

Well, as in the art of Systems Analysis, before we work out a solution we must first define our problem. In this case what we need is a breakdown of all the tasks and responsibilities that seem to be snowing us with such never-ending impact. In conjunction with this, let's examine our own title or job description. Perhaps we're being paid to manage a data processing installation, or analyze systems. In this event, let's take a real close look at what we're actually doing on the job.

How does our list of duties stack up? Take your high-powered magnifying lens out of the desk drawer. How many of the duties listed truly fit in with the designated job description? How many tapes did you balance today? How many boards did you wire? How many reports did you sit down and type yourself?

How many jobs are you doing personally because you're afraid to trust anyone else in the department with the assignment? How much detail work are you doing that could be performed by an operator or clerk? How much work are you saddled with because of inadequate staff or equipment?

If the answer to all these questions is *"None"*, maybe all you need is a good assistant, and maybe now is the time to start selling management on this idea — in terms of what you *could* be contributing if you had the time. The word, *"maybe"*, of course, will apply to almost every condition mentioned. Maybe your installation is so static there's no place to go and nothing further to be done. A rare situation, but a possibility nonetheless.

More commonly, however, one of the other conditions will fill the bill. Most managers, unless acutely aware of the pitfalls, end up doing jobs that could be delegated to subordinates. Many managers feel that by extending themselves to include routine detail they are acting conscientiously in behalf of management by cutting down costs. In some small installations where an operating supervisor plans, installs, wires and runs, this may well be the case.

Consider Potential Gains

The vital consideration, however, is to measure time used in such activity against potential gain if the same time were used in the pursuit of a higher level of activity — thinking, planning, creating. The average manager earns double the wage of an operator. You're cheating your management if you contribute an operator's performance for a manager's remuneration. Of equal importance, you're cheating yourself.

Sometimes *"doing it yourself"* seems the fastest and most painless way to get a scheduled assignment out of the way. What you may be doing, however, is side-stepping a more vital issue, one that could be affecting the work output in other areas not so apparent.

Perhaps there's a weakness in your staff that needs action. If you're doing a detail job simply because you can't trust anyone else with the responsibility, a personnel or training lack may be implied. Maybe you need someone in your department with a higher level of intelligence or experience. Or maybe you just didn't pay the proper time or attention to breaking someone into the job so that he could be depended upon for reliable performance.

Or, maybe you're processing special jobs yourself because of the extreme importance of the statistics involved. Perhaps they go to the president of the company, who has a disturbing habit of insisting upon accuracy.

This is certainly valid justification for your personal attention. But, is it necessary for you to do all the detail work yourself? Couldn't you assign — delegate — the detail, and maintain a personal *control* on accuracy and appearance? It's worth thinking about if valuable time is involved.

The Worth of Delegation

The whole matter of delegation is well worth thinking about, at sober and serious length. Delegation means

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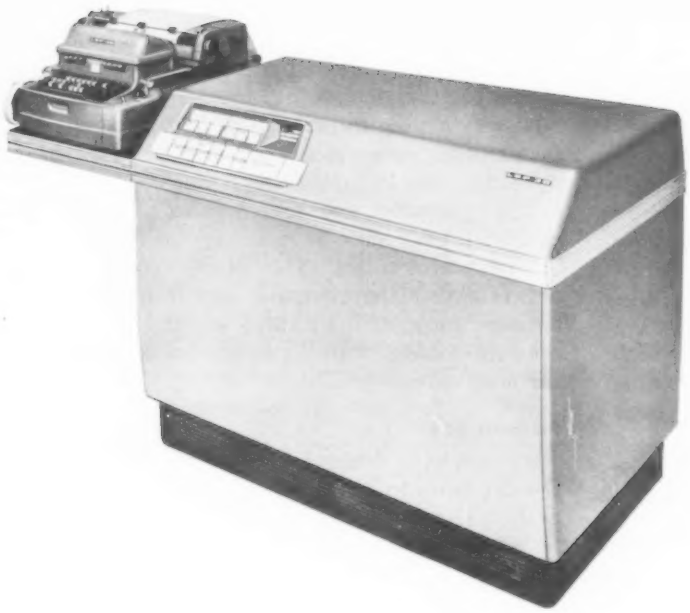

Compiling Statistical Tables

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THE BUSINESS of the Financial Publishing Company of Boston is the publication of a wide variety of financial tables which are used by thousands of organizations throughout the country. These organizations include banks, insurance companies, and sales and consumer finance firms. In addition to the statistical material published, charts and tables are prepared that are tailor-made to customers' requirements.

Most of the concerns serviced use the tables to facilitate the preparation of payment schedules on an installment basis. For example, Financial Publishing issues various brochures dealing with mortgage payments; amortization schedules; mortgage yields, discounts, and premiums; and service charge schedules on mortgages that are serviced.

The firm also publishes over 500 different tables relating to payments on consumer loans. The reason for this large number is that there is a great number of methods for computing charges for consumer loans, at various rates as well as combinations of rates.

Another major phase of the service offered consists of various types of calculations of bond values including: Coupon interest calendar, callable maturity bond values, short time bond values, municipal odd rate bond values, and bond bidding tables.

Despite the wide variety of tables published for distribution to customers, Financial often has to prepare a table specifically for a firm's requirements. The reason may be that the principal amount is an odd sum not given in the published tables, or the method used by the company may be an unusual combination of two methods and so not covered precisely in the statistical material published.

Because of the large number of tables prepared and the huge volume of computations each entails, Financial Publishing faces the problem of performing the required calculations with complete accuracy and of printing the tables as quickly as possible.

Until our Royal McBee LGP-30 Electronic Computer was installed, Financial experienced various difficulties in achieving a high degree of operating efficiency. Before the acquisition of the computer, the company first computed the figures for the various tables, then arranged them for printing and proofread the figures. These computing operations were tedious and drawn out. Because of the deadly monotony of the work, errors often crept in unavoidably, placing upon the staff the burden of checking the figures with extraordinary vigilance.

(continued on next page)

The System

At Financial Publishing, the LGP-30 is used as a production tool to turn out financial tables faster and more accurately than the company was able to do before. It prints every item shown, including all headings except the main title at the top of the page.

With the installation of the computer, productivity has been increased substantially. For example, we now find it possible to let the computer run day and night without an operator in attendance. The increase in productivity is dramatized by this fact: our small computer produces in a working day of eight hours as many tables as were turned out formerly by one man working a full month.

In addition to the production gains we have been able to realize with the computer, the flexibility of the computer's operation makes it possible to meet the diverse requirements of the purchasers of custom-made tables without the slow-downs in production that occurred previously. It should be pointed out that the speedier production and faster service now furnished have led to an increase in the volume of business handled.

The adoption of the computer represents a far cry from the rather primitive operation set up about thirty years ago by Financial Publishing Company when it was founded. The firm began by publishing the series of tables called *"Monthly Bond Values."* This brochure contained thousands of figures, each one of which was then computed laboriously by hand. After these figures had been calculated, they had to be set in the form of the pages that would make up the brochure. After the figures were set, they had to be proofread carefully so that errors could be tracked down and corrections made.

The success experienced with the compilations of *"Bond Values"* led Financial to extend its operations to the compilation of other types of statistical tables. The company began to prepare many types of mortgage payment and amortization schedules. With the growing importance of purchases made by installment payments, the preparation of tables and charts for the consumer finance field was undertaken.

Consumer Finance Tables

Basically, the consumer finance tables are easy-to-read forms that indicate how much a purchaser should pay weekly or monthly for a product that he buys on time. The amount of this periodic payment does not depend wholly on the total purchase price. Other factors that have to be taken into consideration are the length of time in which the loan is to be paid off, the rate of interest that is to be charged for financing the purchase, and the insurance fees. There are innumerable variations in the method of computing financing charges. The one that is to be used in a particular instance depends on the product that is being bought and on local custom.

The computer has been most effective in computing consumer finance tables because of the wide profusion of methods, the many factors that may help to determine the payments, and the sheer volume of such tables. Financial has developed programs for the electronic computer which make it relatively simple to include or omit some specified factor, such as accident and health insurance, in computing the amount to be financed.

The programs are comparatively simple. The computer operators do not have any training in higher mathematics. The people operating and programming the computer ought to have some aptitude for handling figures, but they do not need even the modest training in mathematics required for most college graduates.

Advantages

The growing demand for Financial's services led the company to reach the conclusion that the operation had to be speeded up by the acquisition of an electronic computer. Once it was decided to adopt an electronic computer, three months were spent analyzing the various computers that are available on the market. The company decided finally to select the Royal McBee LGP-30 for a number of reasons. These can be summarized as speed of operation, ease of programming, and the absence of special requirements for making an installation.

The computer is a compact, mobile unit of desk-size. No air conditioning is required for the use of the LGP-30. Nor is there any need for special electrical connections.

But the major advantage, as our company saw it, was the simplicity of programming and of computer operation. Hard-to-obtain and high-salaried computer specialists do not have to be hired to run it.

By a program is meant the sequence of steps that are taken on the computer to solve a particular problem. Once a program is developed, it is run off on tape and is available for future use. Only the raw data have to be changed in subsequent solutions of a similar problem. Financial Publishing does not feel that it is exploiting the computer to the fullest extent. Additional programs, that is, more computational jobs on it, are still being developed.

The outcome of this experimentation has been a sharp step-up of the firm's productivity and an increase in its ability to offer more refined breakdowns of statistical tables without having to hire additional clerical people in the office. After being in use in the office for over 18 months, the LGP-30 has wholly fulfilled the most optimistic expectations of Financial Publishing. ■

New from Royal Precision... RPC-9000

THE LOWEST-PRICED COMPLETE DATA PROCESSING SYSTEM ON THE MARKET TODAY!

Economical design: The new, completely-transistorized RPC-9000 is designed for serial mode of operation. This feature utilizing magnetostrictive delay lines for high-speed memory permits great reduction in original equipment costs. Tape transports using continuously revolving loops of magnetic tape rather than "start-and-stop" techniques further cut initial investment.

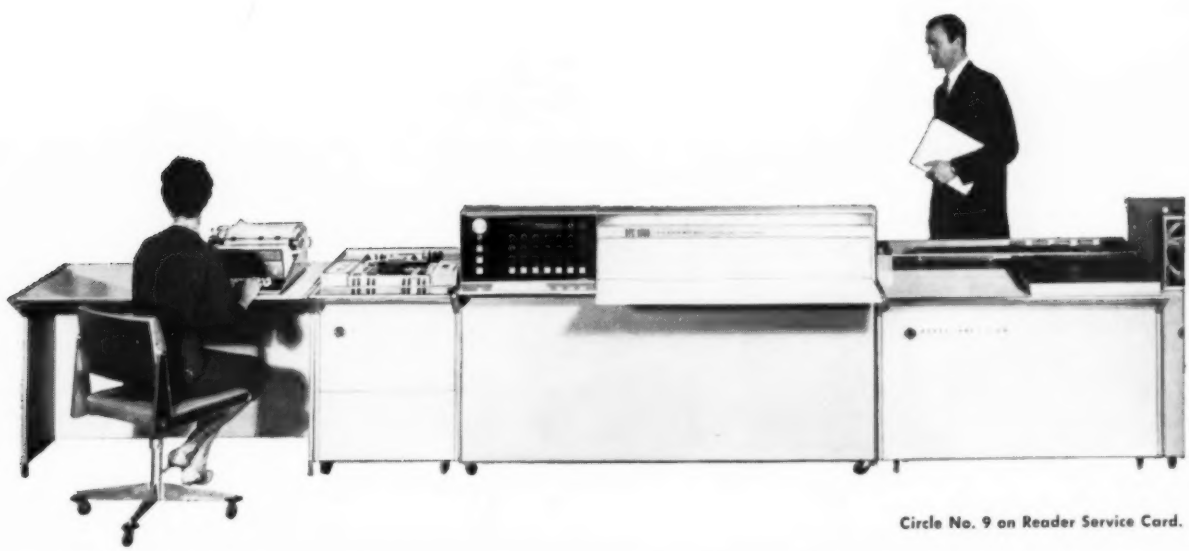
Efficient operation: The RPC-9000 processes data "in line." Data are accepted in random order, and all affected records are automatically updated in a single uninterrupted sequence of operations. No batching or sorting is necessary. Data are recognized by content, not location. This eliminates the need for location codes, and allows efficient utilization of storage capacity. Eight separate records are searched simultaneously. Completely buffered input-output permits simultaneous operation of all system components.

Tailored to your needs: With the RPC-9000 you buy the exact amount of data processing you require. Start with the basic system—computer, tape-typewriter, magnetic tape storage unit. Then, as your volume grows, you can add high-speed paper-tape punches and readers; punched card readers; line printers; additional tape typewriters; more magetic tape cartridges; more internal memory. You can operate up to 30 of these devices at the same time.

Economical in use: The RPC-9000 is designed for ease of operation and maintenance. It uses power from any ordinary wall outlet, requires no air conditioning or site preparation. This low-cost system will perform the full range of your data processing needs. See your nearby Royal McBee Data Processing Systems Sales Representative without delay, or write to the address below for comprehensive brochure.

Royal Precision Corporation

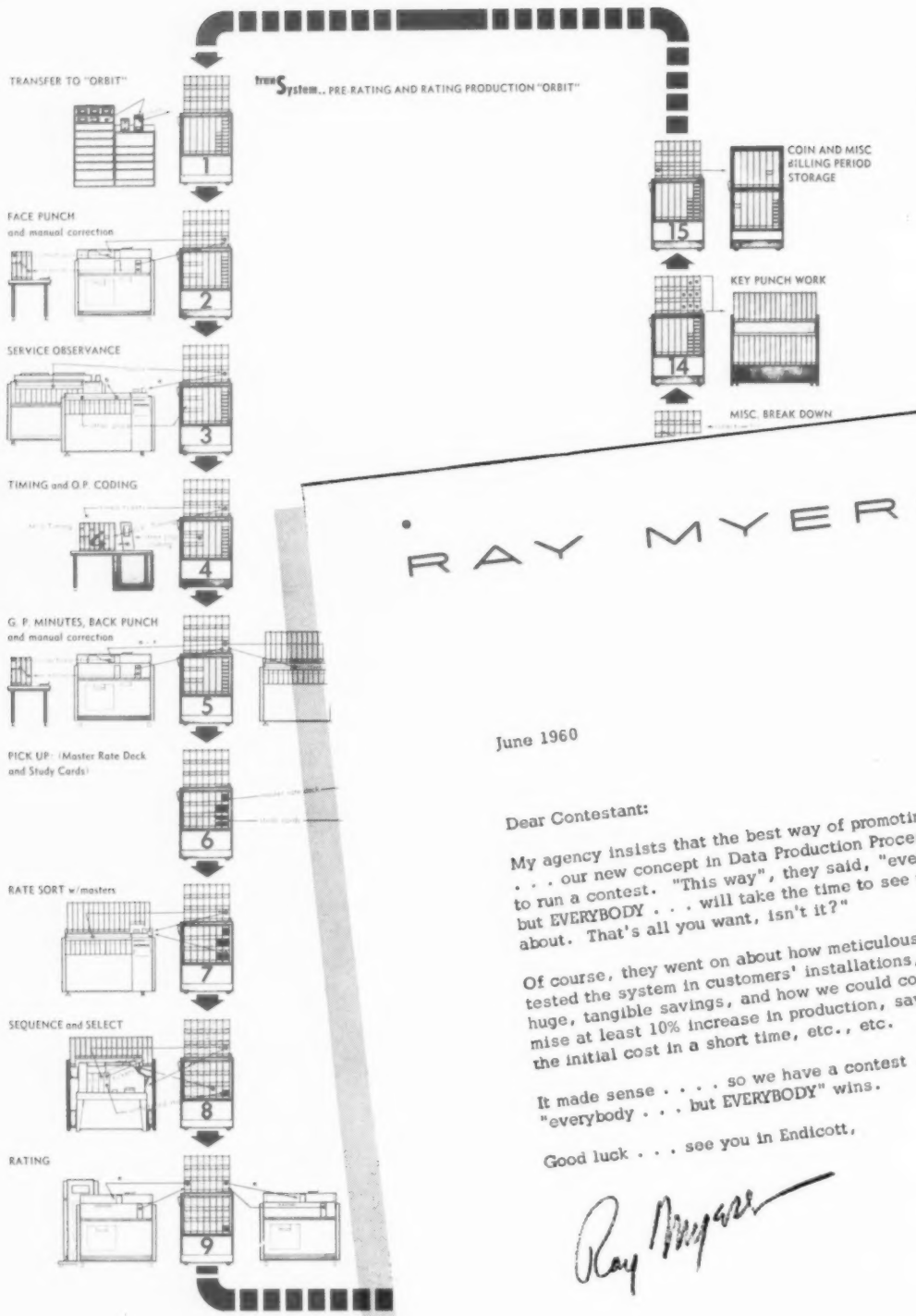
Royal Precision—producers of the LGP-30, the RPC-4000 and the RPC-9000—is jointly owned by the Royal McBee and General Precision Equipment Corporations. Sales and service are available coast-to-coast, in Canada and abroad through Royal McBee Data Processing Offices.



Circle No. 9 on Reader Service Card.

MARKETED BY ROYAL McBEE, DATA PROCESSING DIVISION, PORT CHESTER, N. Y.

If you have sales ability, and are interested in electronic data processing contact your nearest Royal McBee Data Processing Office, or write Sales Administration Director, Royal McBee Corporation, Port Chester, New York.



tranSystem.. CO

RAY MYERS corporation

June 1960

Dear Contestant:

My agency insists that the best way of promoting tranSystem . . . our new concept in Data Production Processing . . . is to run a contest. "This way", they said, "everybody . . . but EVERYBODY . . . will take the time to see what it is all about. That's all you want, isn't it?"

Of course, they went on about how meticulously we had tested the system in customers' installations, resulting in huge, tangible savings, and how we could conservatively promise at least 10% increase in production, saving many times the initial cost in a short time, etc., etc.

It made sense . . . . so we have a contest . . . and I hope "everybody . . . but EVERYBODY" wins.

Good luck . . . see you in Endicott,

Ray Myers

ENDICOTT NEW YORK

CONTEST UP TO $150,000.00

TRIAL INSTALLATION . . . FREE FOR 60 DAYS

RAY MYERS WILL PERSONALLY:

1. Visit the winner's installation for Preliminary Production Study.

2. Bring the winner to Endicott, N. Y. (expenses paid) for a detailed Production Planning Conference which will include the design and development of special production equipment to complement tranSystem . . . if necessary, for ultimate processing efficiency.

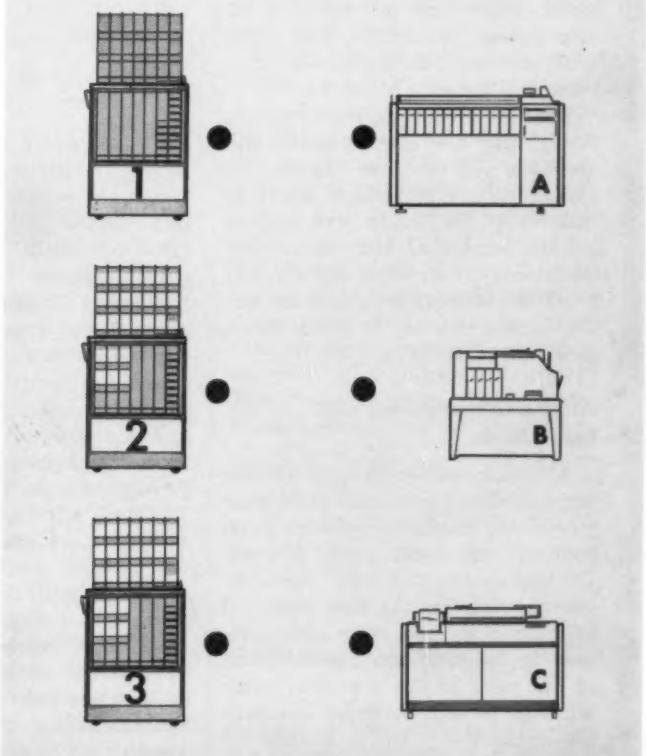
3. Provide complete production flow charts similar to one on left . . . for all jobs.

4. Supervise installation of production system.

5. Spend one week of post-installation production refinement.

6. Guarantee an increase of at least 10% over previous production . . . within 60 days.

The problem is one of production traffic . . . to see that each tranSystem Primary Process Unit (1, 2 and 3) makes a trip to each machine (A, B and C) without crossing another's previous route. In other words, draw a line from each dot in the left row to each dot in the right row without crossing or touching lines.



Circle No. 10 on Reader Service Card.

OFFICIAL CONTEST RULES—ENTER TODAY!

1. Entries may be submitted on plain paper using two vertical rows of three dots each, but must be securely fastened to the application.
2. All entries must be clear and no lines may intersect or touch. Use two dimensions only.
2. Mail entries to Ray Myers Contest . . . Endicott, New York.
4. Entries will be judged on the basis of earliest postmark, simplest, neatest and closest solution to puzzle by Ray Myers whose decision will be final. Duplicate prizes will be awarded in case of ties.
5. Contest is open to Managers of Data Processing Installations in the Continental United States.
6. Contest is void in Alaska, Hawaii and Mexico and where prohibited, taxed or restricted.
7. Entries must be postmarked no later than July 13, 1960.
8. Conferences, visitations, etc. will be at the convenience of the winner, but installations must be completed in 1960.
9. All entries become the property of Ray Myers Corporation.
10. It is NOT necessary to enclose a proFILE carton top with entry.
11. Winner is not obligated to accept trial installation unless he so indicates after Endicott Production Conference.

CONTEST ENTRY BLANK must be completed and fastened securely to entry.
Mail to Ray Myers Contest, Endicott, N. Y.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

DAILY CARD VOLUME _____
MONTHLY CARD VOLUME _____
TYPE OF INSTALLATION _____
NUMBER OF POINTS (IF IBM) _____
LARGEST APPLICATIONS (1)
(2)
(3)

De Paris on EQUIPMENT —A Regular Feature

JOSEPH R. DE PARIS

NEW SYSTEMS

HERE WE GO AGAIN! More electronic computer systems announced! In almost rapid-fire fashion, RCA kicked off two systems, the 301 and 601, Minneapolis - Honeywell announced the Honeywell 400, and NCR waded in with its 390. These announcements were right on the heels of new systems like IBM's 7080, 1620, 1401, and Royal-McBee's RPC 4000, 9000 and Monroe's Monrobot XI.

The data processing galaxy is pulsating with new stars, planets, and satellites. All of them deserve examination and evaluation. Research will reveal the impact and destiny of each. Remember, every galaxy has its comets which burn fiercely and brightly before they fade away and die, in addition to the stars whose brilliance is enduring.

Emphasis on Medium and Small Scale

Although the new systems include large, medium, and small scale computers, the emphasis decidedly is on medium and small scale systems. Evident is the fact that manufacturers recognize the vast potential in every type and every size business for electronic equipment sized to the needs of the customer. After all, even in our advanced economic state, there are but a handful of companies supporting and justifying behemoth computers. By contrast tens of thousands of companies represent the market for smaller scale equipment.

Medium and small scale systems provide an answer to the perennial question of centralization versus decentralization. Here is a *"have-your-cake-and-eat-it"* possibility by using moderate-priced equipment at branch facilities as satellites to a high-powered device at central headquarters.

Trends visible in the new announcements are:

1. A full line of computers by each manufacturer, with a high degree of compatibility of systems and programming.

2. Simplified programming techniques using key verbs and nouns in place of machine language coding.

In the ensuing months this column will devote itself to a critical review of the new equipment and techniques.

☆ ☆ ☆

An interesting marriage of IBM's 1401 and 1620 data processing systems is possible now. On a Request Price Quotation basis, you can augment the 1401's high speed input-output with the 1620's fast computing speeds (*100,000 calculations per minute*) and greater magnetic core storage (*20,000 positions with provision for incremental increases up to 100,000 positions*).

The 1620's paper tape and typewriter input-output are still operative in addition to the 1401's card, tape and printer input-output. Programming for the combined computers probably would be in 1401 language because an average of only four to five digits is required per instruction step as against the fixed twelve digit instruction of the 1620.

A unique possibility is this: Two programs may be processed absolutely simultaneously because two complete internal systems are available.

☆ ☆ ☆

RCA served notice of its intention to play a leading role in data processing by the simultaneous closed-telecast announcement of two new computer systems, the 301 and 601. Together with the 501, this trio makes up the RCA computer family.

Both of the new systems include the latest solid - state technology, modular design, and a disc file storage medium.

The 601 System

The 601 is a large-scale data processing device capable of handling business and scientific problems. As announced, the 601 appears to have a great deal in its favor. Extreme degrees of speed, capacity, and expansion seem possible. For instance, tape speeds of 120,000 characters or 180,000 numbers per second may be realized. Transfers of data are at the rate of 2.5 million characters per second. Core storage memory capacity may be up to 262,000 characters and up to 64-on-line input-output units may be connected. Parallel processing and priority processing are part of the systems concept of the 601. An example of increased power and versatility: A $27,000 per month system will sort 250,000 80-character messages in 48 minutes; a $40,000 configuration will do the same job in 24 minutes.

The 301 is a small scale computer challenging the 1401 in its field. It is offered with a multiplicity of input-output devices and two different sizes of magnetic core internal storage.

Input-outputs include paper tape readers and punches, card readers and punches, an on-line printer, magnetic tape stations, and record (*disc*) files.

The core storage comes in two capacities of 10,000 or 20,000 characters. (*Incidentally, the 1401's core storage at this writing is 4,000 positions, with 8,000 positions soon to be announced.*) Auxiliary storage is provided by up to five record files. This is disc storage of over 23 million characters with random access.

Comparisons between 1401 and 301

Here are some quick comparisons between the IBM 1401 and the 301: The 301 has up to twelve tape sta-

tions, the 1401 has six. Tape station characteristics are as follows: 301 has 250 characters per inch with tape speed of 30 inches per second; 1401 has 200 or 556 characters per inch with tape speeds of 75 or 112.5 inches per second depending on the tape station model. The 301 has a paper tape reader and a paper tape punch both of which operate at 100 characters per second; the 1401 does not have a similar input-output except by the hook-up with the 1620 as mentioned before.

On-Line printers of both systems are rated at 600 lines per minute. The Card Reader on the 301 is rated at 600 cards per minute whereas the 1401 reads cards at up to 800 cards per minute. The Card Punch on the 301 is slow at 100 cards per minute compared to 250 cards per minute on the 1401.

A word about the new Record Files available with the 301. Five files are available, each with 128 discs with data recorded on both sides. Data is organized on each disc as follows: each side has two bands, each band has ten blocks, each block has up to 900 characters. In other words, each record file can hold approximately 4.5 million characters.

A curious note is this: the RCA Record File is designed and looks like a juke-box. In fact, the discs are steel 45 r.p.m. records and they are manually interchangeable. This last feature arouses many systems-design possibilities such as keeping programs on discs and swapping storage data for new programs.

More about the RCA 301 will be told in a subsequent column. ■

DATA . . . yours for the asking

For your convenience in obtaining pertinent and helpful information on the latest equipment, forms, services and related products in the data processing field, we direct your attention to the following free literature available from the manufacturers. Circle the numbers pertaining to the literature you wish to receive on the Reader Service Card appearing elsewhere in "D P."

DATA PROCESSING AUXILIARY EQUIPMENT manufactured by Monarch Metal Products, Inc., is detailed in a 32-page, fully illustrated, two-color supplement and a revised price list. Featured in the supplement is the new line of full suspension files recently introduced by Monarch. Among other key data processing equipment offered are redesigned tub files, a new line of heavy duty and all purpose trucks, new reel storage cabinets, etc. The new price list covers both Monarch Catalog No. 4 and the Supplement.

Circle No. 72 on Reader Service Card.

REAL ESTATE TAX ACCOUNTING PROBLEM, solved in Ramsey County, Minnesota through the use of a Remington Rand Univac 120 Computer system, is the subject of a new booklet published by Remington Rand Division of Sperry Rand Corporation. The booklet explains in detail the technical considerations involved in this conversion. Other features include an appraisal of Univac integrated data processing systems, benefits which may be achieved from the installation of such systems, and Ramsey's plans for wider application of the Univac 120.

Circle No. 73 on Reader Service Card.

ACCOUNTING PROCEDURES as related to application of a computer system are described in an illustrated bulletin. This report, published by Bendix Computer Division, shows how a low-cost computing system may be made to effectively prepare invoices and up-date accounts. The literature points how varying combinations of equipment can meet the needs of individual organizations.

Circle No. 74 on Reader Service Card.

MILLIMICROSECOND CURRENT PULSE GENERATOR. This two page illustrated bulletin from Rese Engineering, Inc., points out the very fast rise time (5 millimicroseconds at moderate currents), illustrates the typical, jitter-free pulses available, and lists complete specifications.

Circle No. 75 on Reader Service Card.

Notable Quotes

"As we proceed toward our destination, perhaps we should be humbly aware, as Dr. Charles J. Reigner reminds us, that 'Glamour is not greatness; applause is not fame; noise is not influence; prominence is not eminence'." . . . "Professionalization," *Office Executive*, Mar. 1960.

"Terminology in the business automation field continues to be confusing, not only to the general public but to those who are involved with it daily as well." . . . "From the Publisher's Desk." *Management and Business Automation*, March 1960.

"This year should show great strides in the use of data processing equipment for scientific management purposes." . . . K. S. Axelson, "Outlook for Electronic Data Processing," *Management Controls*, March 1960.

"One basic difference between the leader and the non-leader is that the former thinks of today's actions in terms of tomorrow's objectives while the non-leader takes each event as it comes, without concern for tomorrow." . . . Laurence A. Appley, The President's Scratchpad, *AMA Management News*, March 1960.

■ ■ ■

Delegate Your Troubles Away!

(continued from page 22)

a happier staff. People like to be confided in and trusted. Delegation means added flexibility of thinking and action for the delegator. If you're out sick, or called away to a conference, do you worry all day that the work won't be done properly? It's easier than you think to delegate such worries away.

Delegation prepares subordinates for more interesting assignments, increased responsibility. It prepares the delegator for the acquisition of higher level know-how and experience. It paves the way to that upper echelon job that is waiting for you somewhere, some time in the future.

■ ■ ■

PRODUCTS & SERVICES

TRACTOR TAPE SYSTEM

This computer tape system will read and write information at a speed of 1,500,000 letters or numbers per second. This is the equivalent of almost four full-length books in one second. The new computer tape system is by far the fastest in the world. Designated TRACTOR, this IBM magnetic tape system is 24 times faster than those used on present large-scale IBM computers.

The TRACTOR tape system is fully automatic. Sealed cartridges containing the reels of tape are stored within the unit. These cartridges are brought into position automatically by the computer for magnetic reading and writing. It can manipulate as many as 640 sealed cartridges holding 220 miles of magnetic tape. Full capacity is 60 billion characters of information — the equivalent of a library of 150,000 volumes.

Circle No. 39 on Reader Service Card.

NATIONAL CONFERENCE ON BANKING AUTOMATION

Representatives from banks in Sweden and Canada gave an international flavor to the first National Conference on Banking Automation in Detroit, May 10 - 12. These good neighbors were joined by American bankers from 26 states, and from 90 different banks, in a high-level interchange of information on the problems of data processing in banking.

Magnetic Ink Character Recognition, MICR, the "Common Machine Language" developed over the past four years by the American Bankers Association, held the spotlight through most of the conference. Only with MICR in its final form, which was announced just last April, have most banks been willing to give serious consideration to the field of machine data processing. The conferees, however, had benefit of much more than a single year's experience in banking automation, since a number of the speakers had been involved in the subject for five years or more.

The Detroit Research Institute, sponsor of the conference, received the plaudits of the bankers in attendance. Banking, the largest non-governmental data-handling business in the world, is moving forward in data processing.

Circle No. 40 on Reader Service Card.

NEW AUTOMATION CENTER

Establishment of a new division of McDonnell Aircraft as a commercial operation offering complete electronic data processing services to industry and commerce in both scientific and administrative work was announced by President J. S. McDonnell.

The new division, to be known as the McDonnell Automation Center, represents the company's first venture in the commercial field. The formation of the new division for commercial work is a logical outgrowth of an internal electronic data processing operation that is believed to be one of the largest in the Midwest.

In the past five years McDonnell has developed an organization of 253 specialists in data processing and systems work and has equipment installed that is valued at more than $7 million plus equipment on order that will increase capacity by five times in the near future.

The company is prepared to offer a complete data processing service including the development of systems and procedures for other business firms and the training of their personnel.

The staff consists of 75 mathematicians and technicians in the scientific computing group and 178 system analysts, programmers and technicians in administrative data processing work.

McDonnell is presently equipped with an IBM 709 and 705 II, as well as smaller computers. An IBM 7090 will be delivered in October and an IBM 7080 is currently on order. The company will market their computer services on a *national* basis but will place special emphasis on selling in the Metropolitan St. Louis area at the outset.

Richard A. Gilbert will be operating manager of the McDonnell Automation Center, reporting to William R. Orthwein, vice president of general services.

Circle No. 41 on Reader Service Card.

REMINGTON RAND INTERPRETERS

A new series of Selective Interpreters, which speed and simplify a whole range of punched card functions from preparation of customer bills and statements through printing of shipping labels, has been announced by Remington Rand Division of Sperry Rand Corporation.

The series consists of:

Type 312-5 Selective Interpreter
Type 312-6 Selective Posting Interpreter
Type 312-7 Selective Posting Interpreter with Dual Card Receiver

The Interpreter is the machine which senses information punched in a card, then prints out the informa-

tion on the card in English or, as with the Posting Interpreter, on the same or other cards. The significance of the Selective Interpreters lies in the fact that they can "select" the data to be printed out.

New Features

Ability to print on any one of 13 lines, as pre-selected on a control dial — above, between, and below all punching positions of the card;

Dial selection of the line to be printed for each run of the deck;

The card to be sensed can be automatically selected either by a dial setting corresponding to control hole punching in the card, or in following cards;

Automatic print suppression of printing on cards containing specified control holes;

Automatic suppression of sensing on all cards in a deck not punched with selected control holes — permitting, for the first time, posting on cards with different punching;

Posting up to 13 lines on a single card, on lines desired, through successive passes of a deck of cards;

Simplified operator setting and control through dials on the front of the machine;

New style type for improved reading of interpreted documents.

Prices are:

Machine	Lease	Purchase
Type 312-5	$190	$ 9,500
Type 312-6	$205	$10,250
Type 312-7	$215	$10,750

Circle No. 42 on Reader Service Card.

(continued on next page)

new
SELF-ADHESIVE
AVERY Tabulabels
• speeds labeling...outperforms old-fashioned addressing 4 to 1
• increases efficiency of tabulators... saves time and money
• sticks without moistening...adheres quickly to any smooth clean surface
JUST 2 SIMPLE STEPS...
FIRST—as the tabulator imprints Avery Tabulabels they smoothly rewind themselves into easy-to-handle rolls.
SECOND—an Avery electric dispenser completes the cycle—and the imprinted Tabulabels are dispensed quickly, easily, neatly!
THIS IS AN AVERY TABULABEL
1 Drug chain codes thousands of warehouse items on bins and shelves with Tabulabels.
2 Mid-West farm equipment mfg. boosts imprinting from 120 to 400 labels per minute.
3 Giant West Coast-bank addresses 7000 packages of travelers checks daily to world wide destinations.
A few market-tested uses for Tabulabels: Addressing envelopes — bin and shelf markers — identifying products and cartons — inventory control — part number identification — labeling file folders — and you may discover others!
AVERY Tabulabels
try them today!
write for
FREE samples now.
AVERY LABEL COMPANY Div. 183
117 Liberty St., New York 6 • 608 So. Dearborn St., Chicago 5 • 1616 So. California St., Monrovia, California • Offices in Other Principal Cities
my name
company
address
city zone state

Circle No. 12 on Reader Service Card.

COMPATIBLE PRINTER

A high-speed printing unit that is compatible with both the Univac line of tape-fed computer systems and those of other manufacture was announced by the Remington Rand Univac Division of Sperry Rand Corporation. It operates at 600 lines a minute. Up to now, it has been applicable only to the Univac line of computers.

Called the Univac Compatible high-speed printer, the equipment is comprised of a tape reader, a control unit and a printer. It functions on the "off-line" principle, which means that the computer itself is not tied up while the printing is being done, and is thus free for other computational work.

The printer will rent for $3,500 a month or it may be purchased at $195,000, the company said. Deliveries will begin in eight months.

The Univac Compatible printer automatically reads, checks and prints out information from the magnetic tape on which the computer has recorded its calculations. It prints entire lines of data at once, rather than individual words or letters. Each of these lines may contain as many as 130 characters — alphabetical or numerical. There are 51 printable characters available — 26 alphabetical, 10 numerical, 15 punctuation and special symbols.

Company reports, records and documents can be printed out in any desired format, at high speed, on sprocket-fed paper forms. The width of the printed lines may vary from four to 27 inches.

Any error detected by the system's internal checking circuits will cause the printer to stop.

Circle No. 43 on Reader Service Card.

WRIGHT PANELS

A complete selection of control panels manufactured to IBM standards, and wires for the panels, are now being offered by The Wright Line, Inc.

The lightweight, low-cost panels, known as "Wright Panels," are sturdily constructed of aluminum, in a golden finish. All wires are color coded for quick and easy identification.

The 402-3 panel is self-contacting, thus eliminating the need for jacks and permitting much faster wire checking and changing when required.

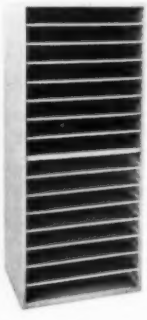
The new Wright Panels will be on display for the first time at the NMAA Convention in San Francisco. Wright Panels will be available through all of the firm's branch offices throughout the United States and in Canada.

Circle No. 44 on Reader Service Card.

UNISTORALLS

The Wright Line, Inc. announced the complete redesign of the UNISTORALL line. The new models match existing UNISTORALL equipment in outward appearance. However, redesign has greatly increased the storage capacities and flexibility of the units. Shelf storage of control panels as well as channel storage is available and all models are available with or without covers.

Circle No. 45 on Reader Service Card.



STORAGE CABINET

For large capacity and flexibility of storage of control panels, The Wright Line, Inc. had developed and introduced this new cabinet. The cabinet is 60" in height and equipped with 16 removable shelves. This allows flexibility of storage of either permanently wired or temporarily wired panels as well as boxes, forms or even file trays.

The new cabinet will hold 16 triple panel boards or 32 double panel boards or 48 single panel boards, or a combination. It is also arranged to hold 16 Univac #60-120 panels. Guide rails along the shelf edge allow for easier withdrawal or insertion of panels.

Circle No. 46 on Reader Service Card.

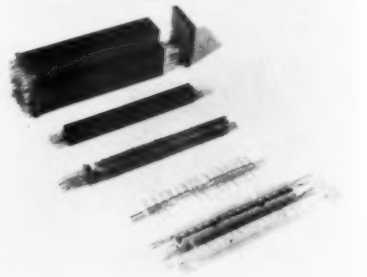
ASSEMBLY TECHNIQUE

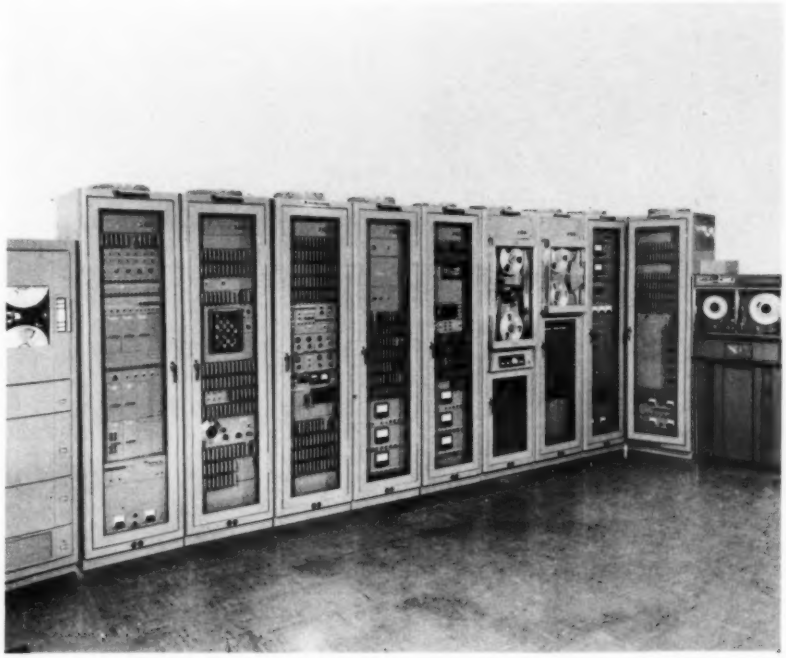
The new "MiniWeld" technique achieves the maximum possible ultra-miniaturization of standard electronic components. This unit achieves five times the packing density of the conventional printed board construction for electronic hardware. A new welded matrix method makes possible the inter-connecting of the MiniWeld modules with a minimum of space loss.

During the assembly process nickel ribbon wire leads are virtually woven together. The standard components are stacked in contact with each other between mylar film. Then various sub-circuits and components are welded together to complete modules. The entire element is finally "potted" by encasing in an insulating compound which makes it highly resistant to shock and vibration.

The MiniWeld technique is a development of Sippican Corporation and Francis Associates, both of Marion, Massachusetts. The Engineered Electronics Company has become affiliated with these two New England organizations through its parent, the Electronic Engineering Company of California, Santa Ana, Calif., which purchased twenty-five per cent interest in the Sippican Corporation.

Circle No. 47 on Reader Service Card.





COMPUTER LANGUAGE TRANSLATOR

An electronic data processing system is making it possible for two computers to "talk" to each other in a common electronic mathematical language at the U. S. Navy David Taylor Model Basin near Washington, D. C.

Delivery and acceptance of the system, which is known as a ZA-100 "Computer Language Translator," was announced by the officials of the Electronic Engineering Company of California, Santa Ana, Calif., designers and manufacturers of the equipment. The ZA-100 performs 13 electronic data translations.

Located in the Applied Mathematics Laboratory of the David Taylor Model Basin, the Translator enables two computers, the IBM 704 and the Remington Rand Univac, to freely interchange mathematical data or to process raw scientific data.

The ZA-100 will translate either Univac data into IBM 704 data or vice versa, or it will translate analog or binary data from hydro-mechanical and structural tests, and spectrum analysis data into either of the two computer formats.

Other Computer Language Translator systems are now in operation at the System Development Corporation, Santa Monica, Calif., The Martin Company, Denver, Colo.; and at the North American Aviation, Inc., Missile Division, Downey, Calif.

Circle No. 48 on Reader Service Card.

609 CALCULATOR

The IBM 609 calculator is a low-cost, solid state punched card calculator for use in a broad range of commercial, industrial and engineering applications. The new machine combines the functions of input, calculation, storage and output in a single cabinet. No air conditioning or special power lines are required.

A high-speed machine, the 609 can perform additions and subtractions at micro-second speeds (12-digit numbers in only 392 microseconds), and multiplications and divisions in milliseconds. The 609's storage is in the form of magnetic cores. The basic machine offers 240 positions of core storage. This can be increased to a maximum of 384 positions.

Standard IBM punched cards are used for input and output. The machine will read and punch cards at a basic rate of 200 cards per minute.

Programmed by wired control panels, the basic 609 is equipped with 80 program steps. Each is capable of performing three separate operations. A maximum of 144 program steps can be incorporated in the machine.

All program steps are non-sequential. This permits the 609 to make logical decisions on the steps to be used in solving a problem without regard to sequence. This means that many jobs formerly requiring multiple machine runs can now be combined into a single pass through the new calculator.

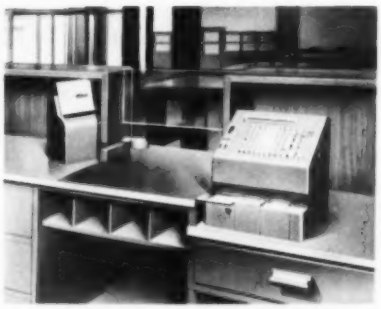
The 609 will rent for $1,175 a month. It will sell for $55,500.

Circle No. 49 on Reader Service Card.

MAGNETIC INK FORMS

Consolidated Business Systems, Inc., New Brunswick, N. J., recognizing the unlimited applications of common machine language to business forms and systems, announced the availability of forms printed with magnetic ink. Consolidated is also introducing a consulting service for firms interested in employing magnetic ink character recognition as part of their forms handling procedure.

Circle No. 50 on Reader Service Card.



AUTOMATIC WINDOW TRANSACTIONS

A new machine designed to speed up service and insure accuracy at the teller's window in banks has been developed by The National Cash Register Company. The machine combines in two compact units the functions presently performed by a conventional teller's machine, an adding machine, and a hand-operated coin dispenser.

The teller's machine figures automatically the amount of change due a customer. At the same time it acti-

vates a change dispenser which instantly delivers the proper coins to the customer. The device is the first automatic money-handling mechanism developed for bank tellers' use.

Change transactions in banks include the cashing of checks, the depositing of checks when the customer wants part of the check returned in the form of cash, and the payment of loan installments, utility bills, Christmas savings or other accounts by either cash or check.

Typical Transaction

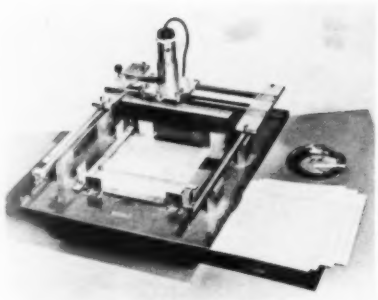
With present teller's equipment, a typical window transaction frequently involves several adding machine or paper-and-pencil mental calculations, each of which offers an opportunity for error. For example, a depositor might hand to the teller a paycheck with a deposit slip which called for part of the check to be deposited, part to be used in paying a loan installment, part to pay a utility bill, and the balance to be returned in cash.

In many cases the check tendered in transactions of this type is insufficient to take care of the various payments and the balance must be covered by the depositor with an additional cash payment. In such cases the new machine automatically detects that further payment is required, shows the teller the amount still due, and then automatically figures the change and dispenses the coins for the amount of cash given to the teller in payment.

A "controlled subtraction" feature has been included in the keyboard, but the subtraction feature does not interfere with the audit control of totals. All necessary totals such as "Deposit," "Cash In," "Cashed Checks," and so on, are under lock control to provide an automatic audit of transactions, and the subtraction feature has no effect on such locked-in totals. Thus miscellaneous addition and subtraction, listing, and facility to obtain debit and credit totals makes the teller's machine capable of handling routine adding machine jobs.

The teller's machine has facility to accumulate as many as nine separate classification totals. It will also validate media of all types, providing an accurate tie-in with the audit tape of the machine.

Circle No. 51 on Reader Service Card.



INFORMATION RETRIEVAL

A new line of information retrieval equipment is now being produced for industry and government by Jonker Business Machines, Inc. of Gaithersburg, Md. Shown above are the "Termatrex-10" track model and four "keyword" cards. A complete Jonker information retrieval system consists of a "Termatrex" machine (about the size of an electric typewriter), sets of "keyboard" cards (each card set having a basic capacity of 10,000 items of data) and a specially-designed card holder.

The system is searched by placing a number of "keyboard" cards describing a question in the machines. Coinciding holes visible as light dots designate the document answering the question.

Circle No. 52 on Reader Service Card.

FOTOLIST

The new system, called FotoList, winks its camera's eye at great speed, reading the information on individual punched cards and recording that information as continuous or sequential text or listing on a negative from which the printing plates are made.

The new systems machine, developed and produced by the VariTyper Corporation of Newark, N. J., has been in continuous operation with the U. S. Government in the nation's capital for some years before its present release to industry and business at large. The U. S. Navy, Bureau of Ships uses the FotoList System for the simplification and economization of its many listings and directory publications.

One of the system's features, aside from the fact that it eliminates typesetting, is that a single source file of information can be made to "spell-out" a number of different types of publications. For example, the almost astronomical number of parts that go into the construction of ships can all be contained in one file, regardless of ship model. Each file punched card contains the information about a part. Those cards are code-punched so that if it is necessary to produce a listing by alphabet, by part number, by ship model, or by any other required classification, the cards are electronically sorted for that classification and then fed to the FotoList machine. The FotoList organizes the information contained on the individual cards, as a sequential listing in the form of a negative for instant reproduction. The otherwise wasteful duplication of source file information is eliminated together with the costly, time-consuming problem of setting metal type and maintaining it for each separate publication.

Key of Process

The key of the process is that the lines of information, contained on the source file cards, become the lines of type in the final printing — without setting type.

Perfect alignment is achieved with an engineering device that is very simple. All FotoList cards are prepunched with a hole at each end. During the typing operation "pin-grippers" pass through the holes in the cards holding them securely in an exact pre-determined position while the card is typed up. Thus all cards automatically bear their individual lines of information in the same exact position. The process is repeated during the filming operation with each card held with pin grippers when it reaches the camera lens. The result is perfect alignment as well as uniform line spacing.

A single drawer file of cards, used in the process, can eliminate a ton of metal type together with its cost of setting and composing. Proof reading is eliminated because the camera does not misspell or make typographical errors.

Circle No. 53 on Reader Service Card.

VICTOR CLASS 100

The most recent data processing development of Victor Adding Machine Co. research into high-speed transistorized analysis systems is the improved Victor Class 100. Automatic programming now allows analysis of data in any chosen sequence.

With automatic programming (an optional feature), urgently needed information is chosen for analyzation first. Undesired departments or accounts may be completely omitted in the analysis.

When operating under control of the automatic programmer, the number of the department or account to be scrutinized is immediately transmitted to a solenoid-activated Digit-Matic and printed on paper tape. Punched tape data is scanned at the rate of 1,000 digits per second. Desired figures are accumulated and totaled by the electronic register of the analyzer. While this total is transmitted to the Digit-Matic for printing, the programmer has automatically fed in the number of the next department or account to be analyzed.

Engineered to bring modern data processing into the financial reach of medium-sized business and industry, this low-cost system may be used to prepare up-to-date reports on labor, sales, production, inventory and other detailed commercial applications. No special wiring is required.

Price of the basic analysis system: approximately $15,000. Delivery is offered within 120 days of order.

Circle No. 54 on Reader Service Card.

E-Z READ

Jersey Tab Card announced new E-Z READ 5081. This card had every field indicated under each punch position. Many data processing supervisors, in an unselfish effort on their parts to add further to what they felt was a basically sound improvement over the current 5081 stock card, suggested additional features.

The card has the fields indicated BETWEEN every OTHER punch position.

Circle No. 55 on Reader Service Card.

PRINTING REPERFORATOR

The first teletypewriter which will produce a printed message on a standard 11/16 inch punched tape compatible with electronic readers and integrated data processing systems was announced by the TELautograph Corporation, Los Angeles. Distribution quantities of the machine — the Olivetti T2PN Printing Reperforator — are now in stock at the Los Angeles factory and are available for immediate delivery.

In both sending and receiving messages, it prepares a conventional, fully-perforated, 11/16 inch five-channel tape. At the same time, the machine prints a typewritten message between the feed holes of the perforated tape.

The tapes produced are printed-and-perforated media which are compatible with optical or electronic tape readers. The T2PN provides printed and perforated tapes which can be stored under systems now used only for uninterpreted tapes.

The machine is a printing reperforator which is also a self-contained teletypewriter. That is, it is the unit with direct keyboard operation. It is compatible with existing teletypewriter circuits and machines and can be delivered for 60 wpm or 75 wpm operation. There are almost 20 different keyboard options available, including four-bank machines. These are designed for compatibility with typewriter systems. The punching codes for upper and lower case with other teletypewriter systems are programmed into the four-bank machines automatically.

The T2PN is approximately the same size and weight as an electric typewriter. Two variations are available. The T2PR is an on-line machine for receiving only. The T2PL is for off-line use in tape preparation. TELautograph makes the machines available on either a rental or direct sale basis. The T2PN rents for $37 per month, sells for $1,900. The T2PR costs $30 per month or $1,555. The T2PL is $25 per month or $1,260.

Circle No. 56 on Reader Service Card.

"ROBOT" PRESS FORMS

A high-speed automatic press, developed by Baltimore Business Forms, is turning out punched cards several times faster than by previous methods. This speed, reports the producers who own the machine, means that multiple copy punched cards can be made on an economical basis.

The new punched card press uses roll stock to obtain high speed production. It prints on paper and punched cards, inserts carbons between parts of the forms, glues them together, perforates the leaves, scores the cards for bursting, cuts off finished forms, and stacks them in piles for wrapping. The machine also features automatic registration between copies, has its own built-in quality control instruments, and lubricates itself with automatic mist lubrications.

Circle No. 57 on Reader Service Card.

DIGITAL PRINTER

The Equipment Division of Epsco, Incorporated, announced the availability of its Model DP-834 Digital Printer, a solid-state militarized Digital Printer which complies with the requirements of MIL-E-4158B and is automatic in operation.

With a capacity of 11 columns, the DP-834 prints at speeds up to 5 lines per second. It accepts decimal data for six columns from measuring instruments, prints function and polarity as well as decimal point location, and provides three columns of test number identification.

Circle No. 58 on Reader Service Card.

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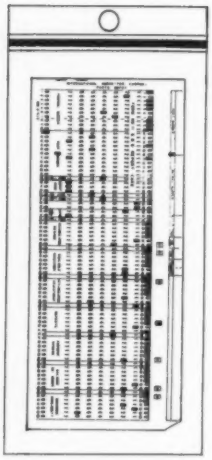

PUNCHED CARD HOLDER

A type of holder for punched cards and forms, which provides record visibility and can be used indoors or outdoors, has been introduced by the Chicago Desk Pad Company. Called *"Poly-Zip"* Holders, they are made of transparent polyethylene and feature a patented closure. The *"Poly-Zip"* closure provides an airtight, weather-resistant seal by pressing the fastener together by sliding the fingers over it. It is opened by inserting a finger at the top of the closure and giving a slight pull.

"Poly-Zip" Holders have a punched extension at the top for easy hanging and storage. *All four sides are closed,* with three sides heat sealed and the patented closure at the top. The holders have a list price of twenty cents each.

Circle No. 59 on Reader Service Card.

REAL-TIME REFERENCES

Chrono-log Corporation digital clocks and digital calendars are available to provide time and date information to computers and data processing systems. The Chrono-log clocks and calendars are used in monitor systems and supervisory systems on digital computers. By providing a real-time reference, the clocks and calendars permit the computer to perform cost accounting and operations analysis computations for each job run on the machine without operator intervention.

Chrono-log real-time reference systems are available at prices ranging from $290 for a digital clock with time output of hours and minutes up to $980 for a clock-calendar system which reads the month, day and time to the nearest second. Special internal circuitry to permit operation with various computer systems can be furnished as required.

Circle No. 60 on Reader Service Card.

SEQUENCE TIMING

A sequence timing board for actuating three stopwatches at the same instant with a squeeze of the hand which carries the board, was announced by Heuer Time Corporation. Based on a design used by time-and-motion personnel to collect *"standard data,"* it is called the Multi-Sequence Board.

The unit times sequential steps with zero time loss between those steps. The procedure is to start with Timer 1 at zero, Timer 2 stopped at any point other than zero, and Timer 3 in motion. Each step is timed *out* — and the observer has the duration of any step to record *"frozen"* data from the previous one. The board is of 3/16-inch thick black Plexiglas, shaped for arm comfort. Watches and timers may be wound and operated without removal from the board. A left-handed model is also available. Cost is $18.75.

Circle No. 61 on Reader Service Card.

PEOPLE AND PLACES

DWIGHT D. MOONEY

CHARLES D. SCRIBNER

REMINGTON RAND

DWIGHT D. MOONEY has been named director of patents in the office of the General Counsel for the Remington Rand Division of Sperry Rand Corporation. For the past thirteen years he has been a member of the Patent Department of the IBM Corporation where he was in charge of policy and staff supervisory matters for the director of patents.

CHARLES D. SCRIBNER has been named vice president in charge of personnel for the Remington Rand Division. Since 1958, he has been vice president in charge of personnel for Vickers Incorporated, Detroit, another Sperry Rand division.

PHILCO

The appointment of RICHARD HOLDEN, Rear Admiral US Navy, Retired, as director of the advanced

systems development department of Philco Corporation's Government and Industrial Group was announced. In this capacity, Admiral Holden will coordinate Philco's activities in this area with extensive emphasis in anti-submarine warfare. Admiral Holden's most recent assignment in his 26-year service career was as planning officer for Underwater Warfare Research and Development on Admiral Hayward's staff at the Chief of Naval Operations, Washington, D. C.

CONRAD YOUNG was appointed marketing manager of the communications and weapons division for Philco's Government and Industrial Group. He will have full responsibility for the direction of sales, contracts and planning. Activities of this division include Philco programs in communications, radar, missile and missile fuzing fields.

IBM

ALBYN McCULLOH has been appointed special counsel in the office of the secretary, International Business Machines Corporation announced. He was formerly counsel for the IBM Federal Systems Division. He is succeeded as counsel by WILLIAM T. RUSSELL, who was corporate staff attorney.

Three executives of IBM were promoted to key manufacturing positions in the Company's General Products and Data Systems Divisions. HORACE W. THUE was named assistant general manager in charge of manufacturing. He was formerly general manager of the division's manufacturing plant at Endicott, N. Y. Succeeding Mr. Thue as Endicott general manager is FRANCIS G. PAUL. Mr. Paul previously was the assistant general manager at IBM's Data Systems Division's manufacturing facilities in Poughkeepsie, N. Y. WARREN K. LIND was named assistant general manager of the Poughkeepsie plant. He was formerly assistant general manager at the General Products Division's San Jose, Calif., plant.

NAMED AT AERONUTRONIC

JOHN AGNITCH has joined the Marketing Staff of Space Technology Operations at Aeronutronic, a Division of Ford Motor Company, Newport Beach, Calif. RICHARD T. BARRETT, formerly Advanced Systems sales manager for Lockheed Electronics Company's Newport Division, has joined Aeronutronic as manager of Systems Marketing, Range Systems Operation. DAVID M. CONRAD has been named manager of Administration for Space Technology Operations and CARL R. JARDINE has joined the company as manager of Computer Components, Computer Operations Marketing.

AUTONETICS

JOHN A. MACHINA has been appointed Industrial Products sales supervisor for the central marketing region for Autonetics, a division of North American Aviation, Inc. Machina is in charge of the Industrial Products sales and service office in Chicago, Ill.

BATTELLE MEMORIAL INSTITUTE

MICHAEL TIKSON has joined the staff of Battelle Memorial Institute, Columbus, Ohio, where he will be in charge of the digital computing center. The author of several papers on mathematics for digital computers, Tikson has been a member of the policy committee of the Univac Scientific Exchange. The new Battelle staff member received a B.S. from Youngstown University, an M.A. from Lehigh University, and an M.S. from Massachusetts Institute of Technology.

KINEPLEX SALES ENGINEER

ELDON MAY has been named data communications field sales engineer for Collins Radio Company's Western Division, Burbank, Calif. He will handle sales of Collins Kineplex data communications systems to military, government and commercial markets throughout Colorado, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan and Indiana.

MINNEAPOLIS-HONEYWELL EXPANSION

Datamatic Division of Minneapolis-Honeywell has opened a branch sales office in Detroit as part of a program to expand its electronic data proc-

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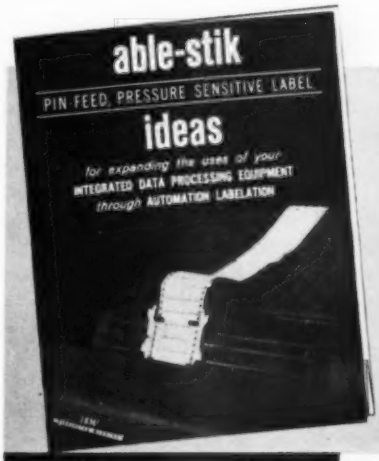
SEND TODAY FOR THIS FREE PORTFOLIO

that shows how you can save up to 95% on label setup time, as reported by U.S. Testing Company



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Gentlemen:
Please send me your free Portfolio of Data Processing label ideas, along with contest entry blank.

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Title _____
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City_____ Zone____ State_____

essing marketing and service operations in Michigan and adjacent areas. DONALD F. BROSNAN, former Datamatic sales representative in Washington, has been appointed Detroit branch manager. Territory covered by the Detroit branch embraces all of Michigan and Ohio and the western counties of New York and Pennsylvania and is served by resident sales representatives in Detroit, Cleveland, Pittsburgh and Cincinnati.

HERBERT F. MITCHELL, JR., has been appointed a regional systems sales manager for Datamatic Division of Minneapolis-Honeywell, and will be headquartered in the New York City sales offices. Mitchell's appointment to this newly created post is part of a nationwide expansion of Datamatic's marketing organization that will further improve its service to users of electronic data processing systems.

NEW ANAHEIM DIVISION

ROBERT T. ARNOLD was appointed Division Manager of the newly organized Anaheim Electronics Engineering Company of California. He was formerly president and treasurer of the Anaheim Electronics Company, Inc., which was recently purchased by the Electronic Engineering Company. The newly formed division will continue to manufacture and market a punched tape programmer and a relay tester, the main products of Arnold's old company. Arnold served as president and corporate director of the company which he co-founded in 1956.

MINIATURIZATION AWARDS

ELDON C. HALL, head Digital Group, Instrumentation Laboratory, MIT, and SAMUEL A. FRANCIS, partner of Francis Associates, Marion, Mass., and a director of the Sippican Corporation, Marion, Mass., received Certificates of Excellence as a result of the 1959 Miniaturization Awards competition. Hall and Francis won their certificates for a digital computer packaging developed by them using the "MiniWeld" process. This process allows the computer to be constructed in one encapsulated assembly for a total volume of less than one-eighth (.12) of a cubic foot.

The unit is about one-fourth the size and one-half the weight of previous designs using the printed circuit package. The computer logic is obtained entirely through use of a single standardized circuit (NOR-gate) which performs all required logic functions through its interconnection scheme. The unit also contains memory sections, associated clock circuitry and input-output circuitry.

NEW FORMS PLANT

The construction of an additional forms manufacturing plant for The Standard Register Company in Dayton has begun. The new building, located west of the present main plant, will be one-story, designed to provide 37,000 square feet of additional manufacturing and storage space. Construction of the new facility is scheduled for completion by late September and the forms producing operations will start immediately thereafter.

SDC

HAROLD P. FIELD was appointed Director of Plans and Programs for the System Development Corporation. Nominated "One of the Ten Outstanding Young Men of the Year" in 1958 by the U. S. Junior Chamber of Commerce, Mr. Field came to SDC following 13 years with Stromberg-Carlson. His most recent position was Director of Marketing of S-C's Electronics Division in Rochester, N. Y.

TELEX, INC.

Two Twin Cities engineering executives have been appointed assistant vice presidents of Telex, Inc. They are BYRON D. SMITH, Vice-president and director of Midwest Technical Development Corporation, and DONALD K. SAMPSON, who has held a staff engineering post at Telex since he joined the company. The two men will be in charge of administration and engineering, respectively, for Telex's Data Systems Division.

LABORATORY FOR ELECTRONICS, INC.

Laboratory for Electronics, Boston announced the appointment of RICHARD S. LESLIE, Director of the Service Division. Mr. Leslie coordinates and directs all Field Service activities including the operation of Maintenance Depots. Within the scope of the Service Division lies the responsibility for stationing representatives at all major USAF bases. These men provide round-the-clock technical information to the Tactical Fighter Squadrons who operate LFE Doppler navigational systems installed in their aircraft. The Training Department, which provides four-month courses to Air Force personnel in the operation and maintenance of the Doppler systems, is also under Mr. Leslie's direction.

FRED MOSKOWITZ, Ph.D., is Assistant Director of the newly established Advanced Development Division. Dr. Moskowitz will assist in the direction of, and engage in, research and development of new techniques, systems, components and products in the areas of Advanced Communications Systems and Techniques, Navigation of Space Vehicles, Reliability, and Data Retrieval and Recognition.

BASIC

Stromberg-Carlson has developed a tactical communications system whereby battle area reports are displayed on the face of a TV type tube at rear-line command posts. It is called BASIC (Battle Area Surveillance and Integrated Communications). The same company will also design, build and install the monitor and control display system for Project Mercury. This is part of the first manned space capsule in orbital flight around the earth.

ALRIC

Electronic Communications, Inc. received a $9,500,000 subcontract for ALRIC (Airborne Long Range Input Electronic) equipment from Burroughs Corporation. ECI's backlog is now $18,800,000.

WESTERN UNION WORK

Western Union has received a letter of intent from the U. S. Weather Bureau to order a national facsimile network of 19,000 miles for weather map transmission to over 600 stations in 330 cities. The U. S. Air Force has given construction contracts for one of the longest microwave beam systems to Western Union, to be completed in 1961. The basic radio units will be provided by RCA. ■

Product Reports

UNIVAC III

The Univac III computer system, newest addition to Remington Rand's line of large-scale electronic computers, was announced by the Remington Rand Division of Sperry Rand Corp. It is a solid state computer and is described as having a processing speed nine times faster than its predecessor, Univac II, and offering a 25% increase in operating efficiency.

The term solid state refers to the fact that the thousands of electron tubes standard in most computers today have been replaced by components such as transistors and Ferractors whose action depends on the controlled flow of electrons in solid substances. Heat problems and tube failures are eliminated, and maintenance is greatly reduced.

The Univac III is called the lowest-cost system available in terms of cost per unit of output. The system will rent for $15,000 to $30,000 a month, depending upon the system configurations requirements of the user.

Program Interrupt Feature

The new system has a unique *"program interrupt feature"* that automatically tells the computer when its peripheral equipment has finished a task so that it can instantly be put to work again. The computer can therefore keep all of its associated equipment operating at all times. This has been achieved by using a printed circuit similar to that used in Larc, the giant computer designed by Remington Rand for the Atomic Energy Commission.

The entire contents of a standard letter-size file drawer can be stored on a single reel of tape and read by Univac III in 4.8 minutes. Reading, writing and computing can be carried on *simultaneously*, with a reading and writing rate of 200,000 digits per second. Input and output of data is five times faster than Univac II.

Typewriter communication in English can be maintained between the Univac III operator and the computer itself.

Magnetic core memories can hold up to 16,384 words and the system can be readily expanded in order to double that capacity.

Univac III will work with both magnetic tape and punched cards. Its card reader operates at 700 cards a minute, and data will flow from its high-speed printer at the rate of *700* lines a minute. Remington Rand's recently-announced Card-Punching Printer can be used as peripheral equipment, further speeding the production of cards which must be both printed and punched on one or both sides.

Circle No. 37 on Reader Service Card.

STRETCH COMPUTERS

Stretch computers are solid state machines employing transistors and other advanced devices and will sell in a price range upwards of $10,000,000. They will be marketed on a special basis under which the principal elements of the system will be offered for purchase only, while other components will be offered for either purchase or monthly lease. The machines can be used for business data processing as well as scientific computing. STRETCH type machines are similar to one being built by IBM for the Atomic Energy Commission at Los Alamos. Although seventy-five times more powerful than the large-scale IBM 704, the STRETCH class system can be installed in the same floor space.

Technical Characteristics

1. Speed

STRETCH class systems can complete more than 100 billion arithmetic operations a day. These speeds permit extremely low unit costs in data processing. Low unit costs make them ideal for IBM Teleprocessing applications in which the computer

serves as the heart of an extensive network of decentralized office and plant input systems.

The principle of simultaneous operation gives STRETCH type computers their great speed. The system features assembly-line organization plus multiprogramming. It can work on more than one program at the same time.

2. Internal Storage

Internal storage is overlapped to quadruple the effective data flow. A typical system with six magnetic core storage units would have an internal capacity of more than 1,500,000 decimal digits. Data can be retrieved from these main units in 2.18 millionths of a second. But because several storage units can be operated at the same time, the system will accommodate as many as 2,000,000 instructions and 2,000,000 pieces of data per second.

3. Input-Output

Peak efficiency in the handling of input-output devices is provided by a specialized computer within the system called the Exchange. This acts as a switching center. It routes information between the internal system and as many as 32 channels, each of which can handle many input-output devices.

Typical systems of the STRETCH class would include magnetic tape units, card readers, punches, printers and other special devices. All are compatible with input-output equipment on existing IBM computers.

Some STRETCH class computers will have a new random access magnetic disk storage. Each disk unit can hold, for instant use, millions of words of alphabetic or numeric data which can be read into or retrieved from core storage in seconds.

4. Central Processing Unit

A high degree of overlap enables the arithmetic unit to perform well over 1,000,000 logical operations per second. All sections of the central processing unit operate simultaneously. One section gets instructions out of magnetic core storage and makes them accessible to an instruction processing unit. This unit partially decodes the instructions and determines what data is necessary to perform the calculation.

5. Optional Console

The operating console is logically separated from the main computer and makes an optional input-output device. The keyboard, switches, lights, digital display and console printer are all under fully automatic interpretation and control.

6. The "Look-Ahead" Device

A major new feature enables the computer to look ahead beyond work in process and get ready for tasks to come. The "Look-Ahead" device anticipates instruction and data requirements, thus increasing the effective memory speed to make use of the enormous speed of the arithmetic unit. It acts as a reservoir, storing up instructions and data to provide a continuous information stream.

7. The Priority "Interrupt" Device

The computer can put aside what it is doing and turn to special tasks requiring immediate attention. Example: The computer could interrupt its work to process data from a satellite during the brief period the satellite may be within range. It would give priority to those satellite

New

TRACT-A-FILE Jr.

Conquers

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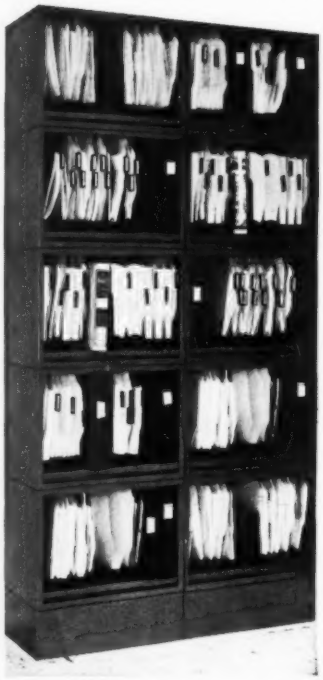

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calculations while all other parallel functions in the system continue without pause. This "interrupt" feature allows many users to have quick access to the computer.

8. Programming

A new set of generalized instructions developed for machines of the STRETCH class greatly simplifies the programming task. To satisfy its requirement for several million instructions a second, the computer automatically assembles its program from the overall instructions given it by the human programmer. There will be a new master control program which enables the machine to organize itself for the most efficient use of its components.

9. Self-checking

STRETCH systems have extensive self-checking, self-correcting capabilities. Data transfers and calculations are completely checked for accuracy. Many errors are corrected automatically without program interference.

Circle No. 36 on Reader Service Card

MACHINES THAT "TALK" TO EACH OTHER

Two IBM Tele-processing data machines—electronic devices that talk to one another in computer language via regular toll telephone calls—were announced by International Business Machines Corporation.

The IBM 7701 Magnetic Tape Transmission Terminal sends business and scientific data at the rate of 150 characters or thirty words a second.

The Data Transceiver equipped with a dial-up telephone feature can transmit ten eighty-column punched cards a minute.

In each case a twin device at the other end of the telephone circuit, which may be across the country, automatically recreates the original magnetic tape or punched card data. Both of these terminals are also capable of operating over telegraph lines.

Typical of the organizations with many field offices for which the 7701 is designed are government agencies and companies in the insurance, petroleum, chemical, steel, automotive, transportation, rubber and general manufacturing industries.

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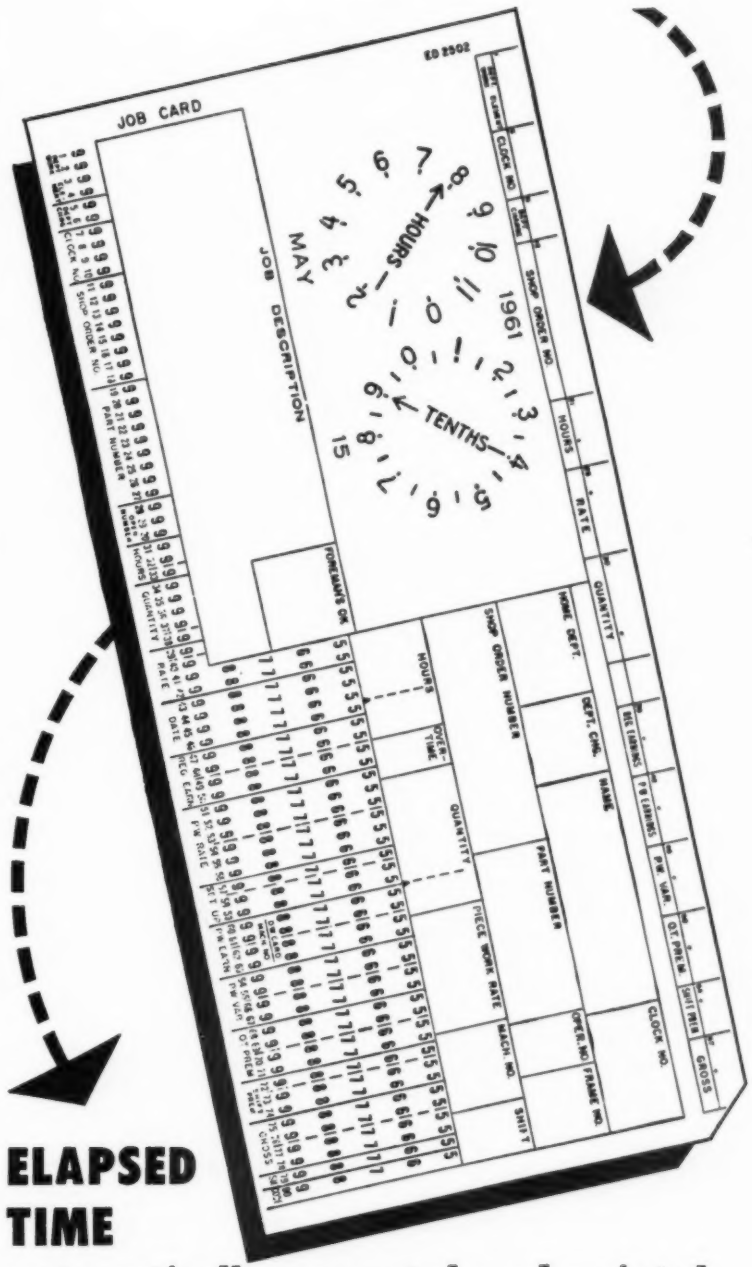

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automatically computed and printed on any job or tab card

If manual computation of elapsed time is time-consuming and error-producing, the automatic, foolproof Calculagraph can eliminate this weak link in your cost system. The time-tested Calculagraph, now available to industrial users, will do the job for you accurately, regardless of the card system you now use — it's that flexible. Write to us now and enclose samples of your job tickets.

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INDUSTRIAL DIVISION

CALCULAGRAPH *Company*

Circle No. 19 on Reader Service Card.

315 Sussex Street, Harrison, N. J.

7701 Magnetic Tape Transmission Terminal

The 7701 will operate on either toll or leased circuits. The advantage of the toll operation is that the user pays only for the transmission time he uses. Operation is similar to ordinary telephone procedure. The operator in the sending location places a standard magnetic tape reel on the 7701 and then dials the telephone number of the receiving location. Learning that data is to be sent out, the receiving location operator verifies that the receiving 7701 is prepared to record the transmission.

Data passes at the speed of 150 characters a second from the 7701, through a modulating subset provided by the telephone or telegraph company, through the communication circuits, to a demodulating subset at the other end, and into the receiving 7701. When the information has been received, both operators simply hang up their telephones.

Equipment Details

The 7701 will transmit and receive the magnetic tapes used on all IBM data processing systems — the 200 character-per-inch tapes used on the IBM 727, 729 I, 729 II, and 729 IV tape units. It provides switch selection for either binary coded decimal or binary tapes. Grouping of records on the received tape is identical to the grouping on the original, transmitted tape.

The new machine features automatic correction of tape reading and writing errors, plus errors in transmission. When an error is detected, the record is re-transmitted automatically up to three times in an attempt to correct the error condition. After three unsuccessful attempts, the machine will stop and signal the operator (by audible alarm and indicator light). A special operating routine permits bypassing of a tape section that contains a permanent error.

The IBM 7701 Magnetic Tape Transmission Terminal (center unit above).

The IBM Data Transceiver with new Digital Subset Feature.

Fully transistorized, the 7701 does not have the special air-conditioning requirements of the average computer installation. The machine may be located in a room outside the computer center.

Data Transceiver Digital Subset Feature

The new Digital Subset Feature adapts the Data Transceiver for operation over conventional dial-telephone lines at regular message rates, or over new high-speed telegraph circuits. Modulating and demodulating devices, available from telephone and telegraph companies, are also required.

Equipped with the Digital Subset Feature, an IBM Data Transceiver may be connected by dialing with any similarly-equipped Transceiver anywhere throughout the country. Here is how the advantages offered by the Transceiver equipped with this new feature compare with the operations of the standard Data Transceiver:

Using Telephone Lines

- ... Uses conventional dial telephone lines at regular toll rates.
- ... Transmits ten cards per minute on the IBM 65 and nine cards per minute on the IBM 66.
- ... Permits direct dial connection to any other Transceiver equipped with this feature at any point served by telephone.

Using Telegraph Lines

- ... Uses newly available high-speed telegraph lines on a time-charge basis.
- ... Transmits up to eleven cards per minute.

The Digital Subset Feature may be installed on Transceiver equipment now in use with leased lines. A switch permits operation over either conventional lines with this feature or over leased lines as a standard Transceiver. Another switch, permitting direct voice or teleprinter operations over the leased line, may be provided by the telephone or telegraph company.

Prices — New IBM Products

	Purchase Price	Monthly Rental
Digital Subset Feature For IBM Data Transceiver*	$ 725	$ 20
IBM 7701 Magnetic Tape Transmission Terminal	$55,000	$1,175

*Note: Below are the prices of the standard IBM Data Transceivers which make use of the new Digital Subset Feature:

IBM 65 Data Transceiver (non-printing)	$8,100	$175
IBM 66 Data Transceiver (printing)	$9,500	$195

Circle No. 35 on Reader Service Card.

■ ■ ■

OUTPUTS

ITEMS OF INTEREST FROM HERE AND THERE

FIELDATA CONVENTION

A top level group of industry and military users of Army FIELDATA data processing equipment convened at Disneyland Hotel, Anaheim, Calif., April 25 - 27 for their fourth national meeting. The group, known as FAST (FIELDATA Applications, Systems, and Techniques), is headed by Captain Grady Bannister, of the Automatic Data Processing (ADP) Department, U. S. Army Electronic Proving Ground, Fort Huachuca, Arizona. The three-day FAST session featured presentations on planned uses of FIELDATA computing equipment, descriptions of the equipment, and methods of programming FIELDATA computers. Technical papers were given by military and industry representatives. Aeronutronic, a Division of Ford Motor Company, Newport Beach, Calif., was host for the meeting.

CREATIVE THINKING

The California Institute of Technology took a big step toward unlocking the secrets of creative thinking with the dedication of a new electronic computer system. Caltech's expanded computer center will enable the Institute to intensify its study of the principles of creative thought, a joint project of the Institute's Biology and Electrical Engineering faculties. Raw data derived from basic research on the human nervous system will be fed into a Burroughs 220 electronic computer, programmed to prepare a mathematical model of the human mind. By the rapid simulation of brain functions on the 220, a nearly infinite number of hypotheses about human thinking can be tested.

CAPITAL LEASING PROGRAM

A leading commercial finance company announced a new milestone in American business finance. Instead of offering equipment for long-term lease, Commercial Discount Corporation will offer long term (5-year) capital for lease — which may be used for acquisition of equipment or for any other company purpose. This capital will be available to growth companies in the office equipment and stationery industry. A minimum of $100,000 and a maximum of $1,000,000 will be set for any one company. Under the Capital Leasing Program, a company for example, leases $1,000,000 from Commercial Discount for three to five years, and buys whatever equipment is desired. At the end of the period, the equipment belongs to the lessee, which makes the Capital lease less costly than the equipment lease.

In order to qualify for the program, a company must have four characteristics:

1. Competent management
2. A history of company profits and ability to repay the capital lease over a five-year period
3. Expansion possibilities
4. Proof that the new funds will be put to constructive use.

LOGICIANS FIRST FOR 7070

A group of fifty logicians took delivery of the first 7070 data processing system produced by International Business Machines Corporation. Their assignment: teach problem-solving short-cuts to the 7070 computer. Operating around-the-clock continuously for the next two months, the computer will carry out more than ninety billion instructions during the testing of programs for the new data processing system. Programs, series of instructions which the computer follows to solve problems, must be prepared for customer use in instructing their own 7070's. The group — members of IBM's Applied Programming Department — received the first 7070 off the production line so it could test the new programs in advance of volume delivery of these systems.

SIGN OF SPRING

15,000 Detroiters turned out to visit the three-day Detroit Business Show, sponsored by the Systems and Procedures Association and the Governmental Accountants and Analysts Association. 75 exhibitors displayed general office furniture, adding machines, many image reproducing machines, and some data processing machines. The Gregory Mayer & Thom Company (stationers and printers) produced the most eye-catching exhibit with two beautiful models (a blonde and a brunette) showing modern office furniture.

MEMBERSHIP PLAN

TCMA members at the annual meeting held in New York City approved Associate Memberships for manufacturers of punched card machinery, instrument makers and suppliers, and manufacturers of stock, ink, cartons and other punched card components. The purpose of Associate Membership will be to maintain close liaison with punched card manufacturers insofar as technical problems are concerned and to determine the needs of the industry in the field of product development. The next general meeting of the Tabulating Card Manufacturers Association is scheduled for June 16, in Chicago.

COMPUTERS AND REHABILITATION

Twenty young men, now serving sentences in a Pennsylvania State correctional institution at Camp Hill, Pa., have just embarked on a unique program of rehabilitation, through which they hope to return to life "outside the walls" as electronic computer experts. The State's Department of Property and Supplies has joined with Pennsylvania Department of Justice officials in setting up the pilot training project, and will make its Univac computer in Harrisburg available to the class. Emphasis in the course will be on computer "programming." First, however, a complete orientation in data processing will be given.

FINANCIAL FIRST QUARTER REPORTS

IBM Figures

For the three months ended March 31, 1960, net income of the International Business Machines Corporation was $35,178,509 after estimated U. S. federal income taxes.

(continued on next page)

This is equivalent to $1.92 a share on the 18,280,759 shares outstanding, and compares with the corresponding 1959 period of $28,964,684, equivalent to $1.59 a share on 18,231,464 shares, the number of shares outstanding March 31, 1959, adjusted for the 50% split-up effected May 5, 1959 . . . Net income for the three months before taxes amounted to $72,028.509, compared with $59,297,684 in 1959 . . . Gross income for the three months from sales, service and rentals in the United States amounted to $339,852,677, compared with $295,631,278 in the corresponding 1959 period . . . IBM's gross income for 1959 was $1.3 billion with net income before taxes of $300.1 million and income after taxes was $145.6 million for earnings of $7.97 per share. Dividends per share were $2.03. All these figures are higher than the respective figures for 1958.

EEC Income

The consolidated net income of the Electronic Engineering Company of California increased 28% in 1959. Net income for the company and its wholly owned subsidiary totaled $214,000 for the calendar year 1959 as compared with $167,000 for 1958. Consolidated sales were up 6% with 1959 sales totaling $4,700,000 compared to 1958 sales of $4,400,000. Net income per share in 1959 for 352,062 shares outstanding was 61 cents. The sale of 78,750 new shares in June, 1959, accounted for the change in the number of shares outstanding.

NCR Rises

Net income of the National Cash Register Company rose 23% in 1959 to a record $19,076,000. Earnings in 1958 amounted to $15,512,000. Sales of all products and services reached a new high for the fifth successive year, rising from $393,746,000 in 1958 to $419,064,000 in 1959, a 6% increase. Per share earnings in 1959 totaled $2.52 compared with $2.19 the previous year. At the end of 1959, 7,577,633 shares were outstanding.

Standard Register Gains

Final audited figures for 1959 operations at Standard Register show that sales volume hit $51,950,504, a 12% increase over 1958, and profit after tax went to $3,238,740, a 73% gain over the previous year. Per share earnings were noted at $3.24 as compared with $1.91 in 1958.

SOCIAL IMPACT OF AUTOMATION

Floyd C. Mann and L. Richard Hoffman of The University of Michigan Survey Research Center disclosed findings of a major comparative study on the social impact of automation on employees in two plants — one conventional, the other highly automated. Topics covered include: overall effects of automation, job changes accompanying automation, patterns and effects of continuous operations, supervision, and administrative and research implications of technological change.

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Thomas J. Watson, Jr., President of IBM, announced that three hundred and eighty 700 systems have been installed and that in the coming year IBM will install one hundred and twenty-three 609 calculators, two hundred and seventy-three 1620's, one hundred and forty-one 7070's, eighty 7090's and four hundred and seventy-nine 1401's of the 2800 now on order. He also stressed that the company is receiving many orders for their 1200 Series check processing equipment using Magnetic Ink Character Recognition.

INDUSTRIAL COMPUTER SYSTEMS DEPARTMENT

A department to design, manufacture and market industrial electronic computers and systems has been formed by the Radio Corporation of America. Unlike business computers, the RCA Industrial Computer must be designed for each specific application of automatic process control. The new department will have the flexibility and manpower ability to provide service and products in this field. Principal product of the department will be the RCA 110 industrial computer for automatic control of processes in the petrochemical, power, metal and other industries. Additional products will include data loggers, data accumulators, remote supervisory control systems, and custom-built computers and devices.

ROTEK

Rotek Instrument Corporation has been formed by Samuel Ochlis and Peter Richman to develop and manufacture high precision transistorized instruments for electronic test and development laboratories. A wide range of product lines within several major areas of precision instrumentation is under development by the corporation. Stress is placed on achieving highest precision and ultimate reliability for the equipment, which is being designed to operate under wide environmental extremes, permitting field measurements with true laboratory accuracies. Mr. Ochlis, as President, heads up Rotek's administration, manufacturing and sales activities. Mr. Richman, as Vice President, is responsible for the company's research, development and engineering.

COMPUTER OFFICE

A sales office has been opened in Cleveland by the Computer division of Bendix Corporation. Robert C. Whiting, Midwest regional manager for the division, announced that a staff of engineers and technical specialists under the direction of Manager Paul Buchynsky, will handle sales, service and customer training on the Bendix G-15 computer, with extensive line of accessory equipment, and a new line of computing equipment.

THE 100th UNIVAC SOLID-STATE COMPUTER SHIPPED

The one hundredth Univac Solid-State computer manufactured at the Remington Rand Univac Division at Ilion was shipped this month.

"We began building these Univac Solid-State computers here in Ilion in January, 1959, after some 10 for European delivery were produced at the company's North Philadelphia plant, where they were initially designed and developed," Lawrence A. Girard, general manager of the Ilion-Utica manufacturing facilities of Remington Rand, said.

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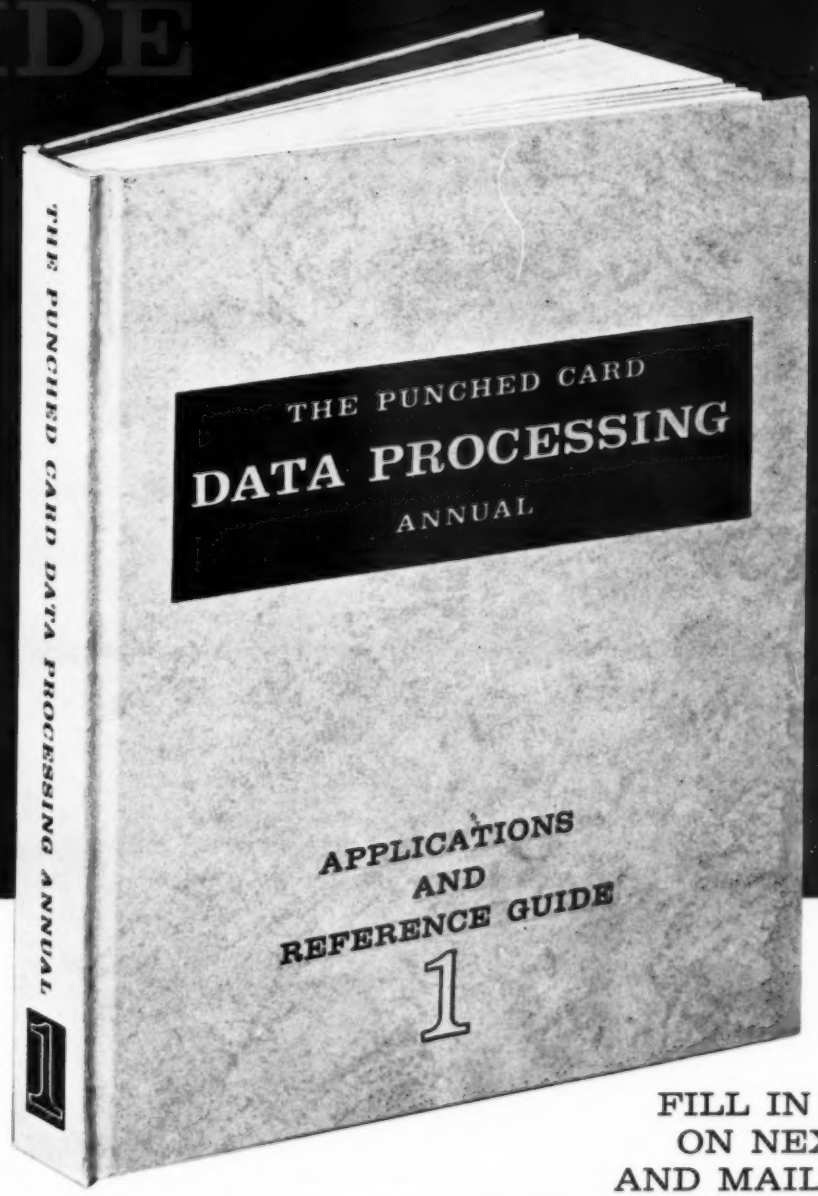

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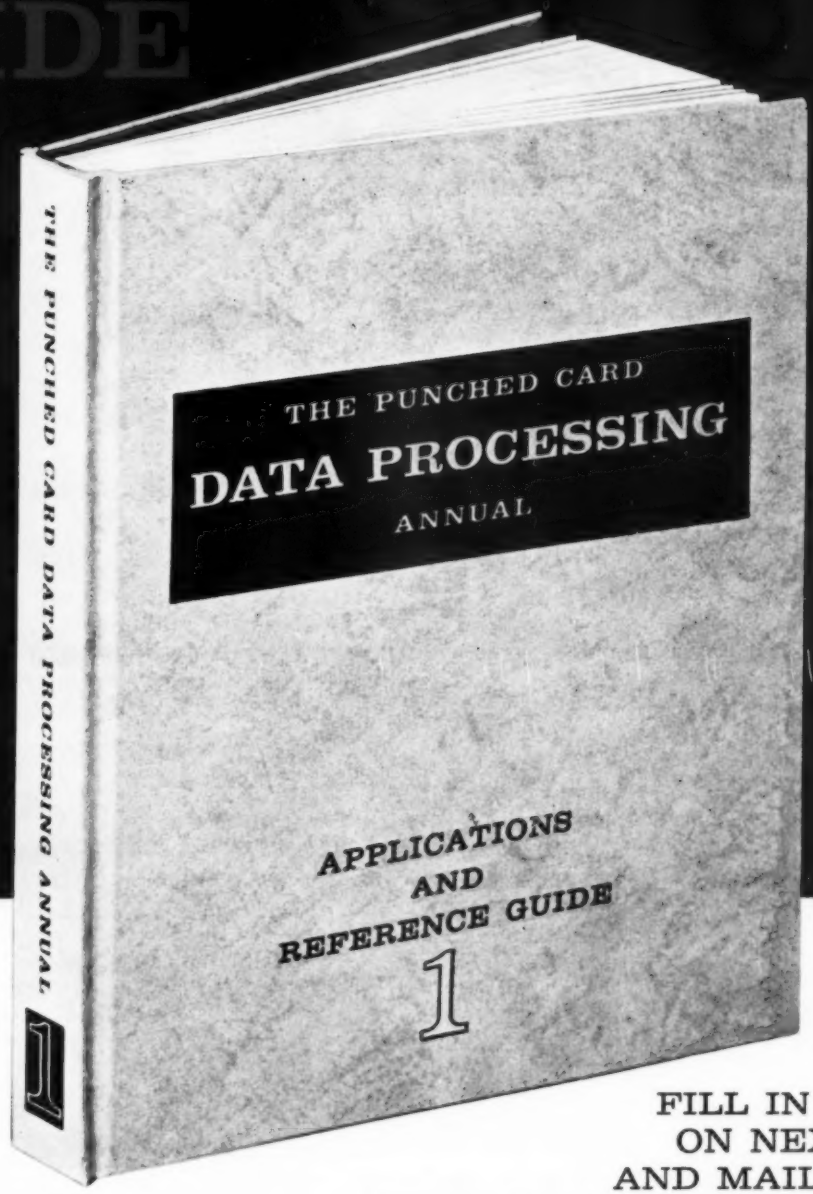

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- General Ledger
- Production Control
- Cost Accounting
- Premium Accounting
- Operations Research
- Other

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Seen in Print

ELECTRONIC DATA PROCESSING BY A CPA FIRM, The Journal of Accountancy, March 1960.

What should the public accountant be doing to assist his clients in gaining the benefits of electronic data processing? Recently, Harold M. Young of Young, Skutt & Breitenwischer, a Jackson, Michigan CPA firm, acquired a Remington Rand Univac 60 to process data for regular clients who wanted the service.

Once they were convinced that electronic data processing offered substantial advantages even to small firms, the partners studied the possible ways in which the indicated advantages could be brought to those companies that could not justify the cost of available equipment. It has proved possible to serve clients at a cost no higher than they would normally pay for manual clerical work and to get the results to them very much faster.

CAN WE AUTOMATE DATA FOR CREDIT DECISIONS? by William T. Holmes, Credit and Financial Management, April 1960.

The Credit Manager will have to live, operate, and make decisions in a world of automated data. There is a growing appreciation among electronic data processing marketing officials that EDP must incorporate advantages whereby traditional information such as the credit history can be presented in useful form without excessive cost. Credit management needs the complete story of how a prospect or customer has paid in the past, if reasonable trust is to be placed on his paying in the future. Credit managers must assure themselves that machines will serve this function and purpose.

WORK MEASUREMENT IN THE MACHINE ACCOUNTING DEPARTMENT by John B. Van Haelen, The Journal of Machine Accounting, February 1960.

The author, president of Office Methods Analysts, Inc., considers the areas in a data processing department that can be measured: clerical activities; key punching and key verifying; machines and machine operations.

To summarize measurement, there are four tools available for the establishment of standards: (1) Historical data; (2) Work sampling; (3) Stop watch and (4) Elemental time values. The important thing is to establish standards on each job, regardless of the technique used.

Work Measurement, Scheduling, Incentives and Costing will not solve all problems. To achieve this goal requires hard work, constant study, and most important, the desire to advance.

(continued on next page)

BEEMAK TAB CARD HOLDERS

BP-100 CARD HOLDER

Can be attached to products, conveyor belts, bins, boxes, shelving, to implement production control, inventory control, invoicing and other punched card systems. Beemak Holders have withstood hard usage for eight years and are made in ivory, red, green, blue, yellow and black for color coding if desirable. Keeping correct tab cards at the source of record data provides better controls and faster handling of all types of merchandise.

BP-130 MAGNET HOLDER

Card holder with four heavy permanent magnets can be attached or hung on any metal surface such as tab machine, filing cabinet or metal desks. Provides finger-tip accessibility to operators, reduces wasted time and chances of error.

1 to 24 $1.50 each; 25 to 49 $1.35 each; 50 or more $1.25 each. Available for immediate delivery from

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CONTROL DATA CORPORATION

501 Park Avenue • Minneapolis 15, Minnesota

FEderal 9-0411

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THE MATERIALS YOU BUY, New York Purchasing Review.

Your business forms reflect the prestige of your company: they are the working tools of management. Forms should be instruments of action.

Your business forms should be studied and analyzed by those people in your organization who have a clear understanding of your company procedures, prior to ordering.

CONTROL AS AN ORGANIZATIONAL PROCESS by Chadwick J. Haberstroh, Management Science, January, 1960.

The research reported is an attempt to discover to what extent the theory of self-regulating systems applies to human organizations in general and to one industrial plant in particular. Feedbacks of information on performance and objectives were found to have much influence on two types of executive decision processes: programming of routine work and innovation in the organization of executive functions. The control pattern included multiple, decentralized control loops.

HOW TO PREPARE FOR AUTOMATION by Eugene Whitmore, American Business, February, 1960.

Everybody who talks about automation does not necessarily need it. Automation in some cases is like stepping from Oliver Wendell Holmes's one-hoss shay to a jet plane. You may or may not be ready for it. If you are ready, it can bring new profit vistas to your company. It can speed every process in your business; it can vastly improve your customer service.

THE NATURE OF COMPUTER CONTROL by George M. Perry, Data Processing Digest, February, 1960.

There are three kinds of controls in any EDP system that will insure error-free data. These are: logic and accounting controls, machine circuitry controls, and internal operational controls. In translating a system from manual to electronic, the computer may need controls which are not apparent in a manual system. Machine circuitry controls are the task of the manufacturer of the equipment. Operational controls must be standardized to be effective. ■

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BOOK SHELF

MANAGERIAL ACCOUNTING — An Introduction, by Harold Bierman, Jr., Ph.D., MacMillan Company, 60 Fifth Ave., New York 11, N. Y., 1959, 483 pages, $10.00.

Managerial Accounting is divided into two major sections. The first, Financial Accounting, gives the reader a good background in basic accounting techniques. It covers the accounting cycle, the concepts and conventions of accounting, the preparation and analysis of financial statements, the nature and accounting treatment of assets, liabilities and stockholding equity, and problems measuring income. The second section concentrates on the managerial uses of accounting. It emphasizes the control of costs and the acquisition of relevant information for decision making. Dr. Bierman has prepared his book with an eye to setting forth the basic principles of accounting simply and clearly.

AUTOMATIC DATA PROCESSING: PRINCIPLES AND PROCEDURES by Dr. R. H. Gregory and R. L. Van Horn, Wadsworth Publishing Co., 431 Clay St., San Francisco 11, Calif., 1960, 705 pages, $11.65.

This volume is a broad introductory textbook on electronic data processing. In non-technical terms this book gives an introduction to the data processing field as well as the fundamentals of equipment and systems environment. The authors originally began the book when they were with the Massachusetts Institute of Technology. It is the outgrowth of work done by Dr. Gregory and Mr. Van Horn for the U. S. Army Ordnance Corps.

PRODUCTION CONTROL by Nyles V. Reinfeld, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1960.

Although written by one man, the actual contributors to this volume are 500 companies whose methods and results were surveyed by the author. Production control methods spring out of the nature and necessities of each business. The methods vary from company to company, and as a result there is no such thing as a standard system to fit all businesses. But there are common denominators among the thousands of techniques from which every company selects the components for its control system. These methods and the author's observations concerning them have been brought together in this book.

■ ■ ■

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Ithaca, New York

June 22-24
1960 National Conference and Business Show,
National Machine Accountants Association
San Francisco, California

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EDP Installations in Operation —A Conducted Tour
San Diego State College, Calif.

Aug. 10-12
Fifth Annual Conference of Bendix G-15 Users EXCHANGE Organization
Pittsburgh, Pennsylvania

Sept. 22-23
Univac Users Association
Washington, D. C.

editorial

FEW PEOPLE in the history of the world have had the opportunity presently attending us in the field of data processing.

Punched card equipment, a modest step toward automation during the past half century, is inevitably yielding to computers. The punched card itself has an uncertain future in the shadow of character reading devices, MICR, and magnetic memories. More than seven large corporations are now racing to market new equipment. (Some fifteen computer-magnetic memory systems have been announced in little over a year.)

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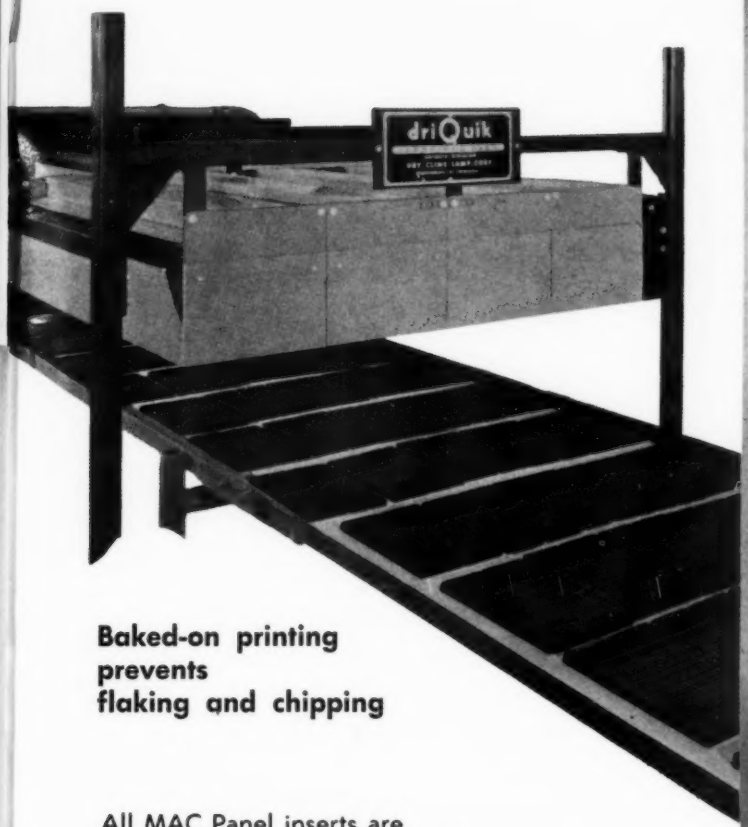

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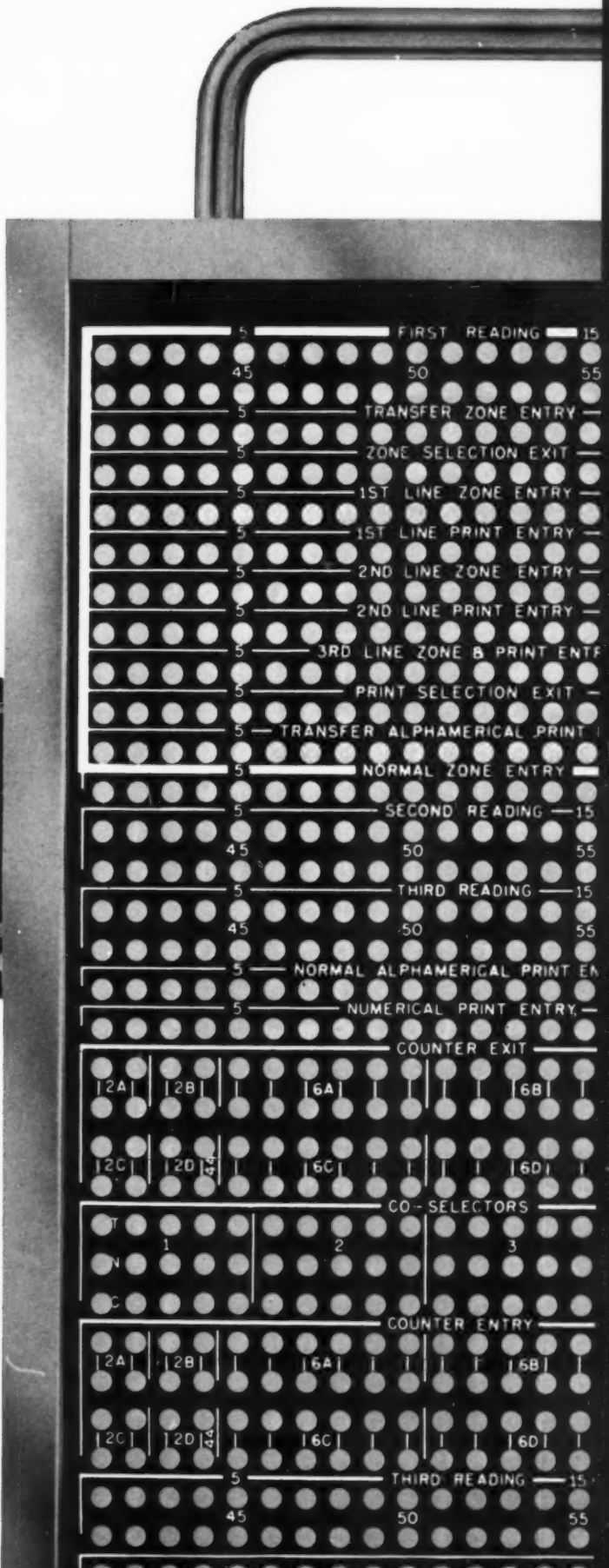

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